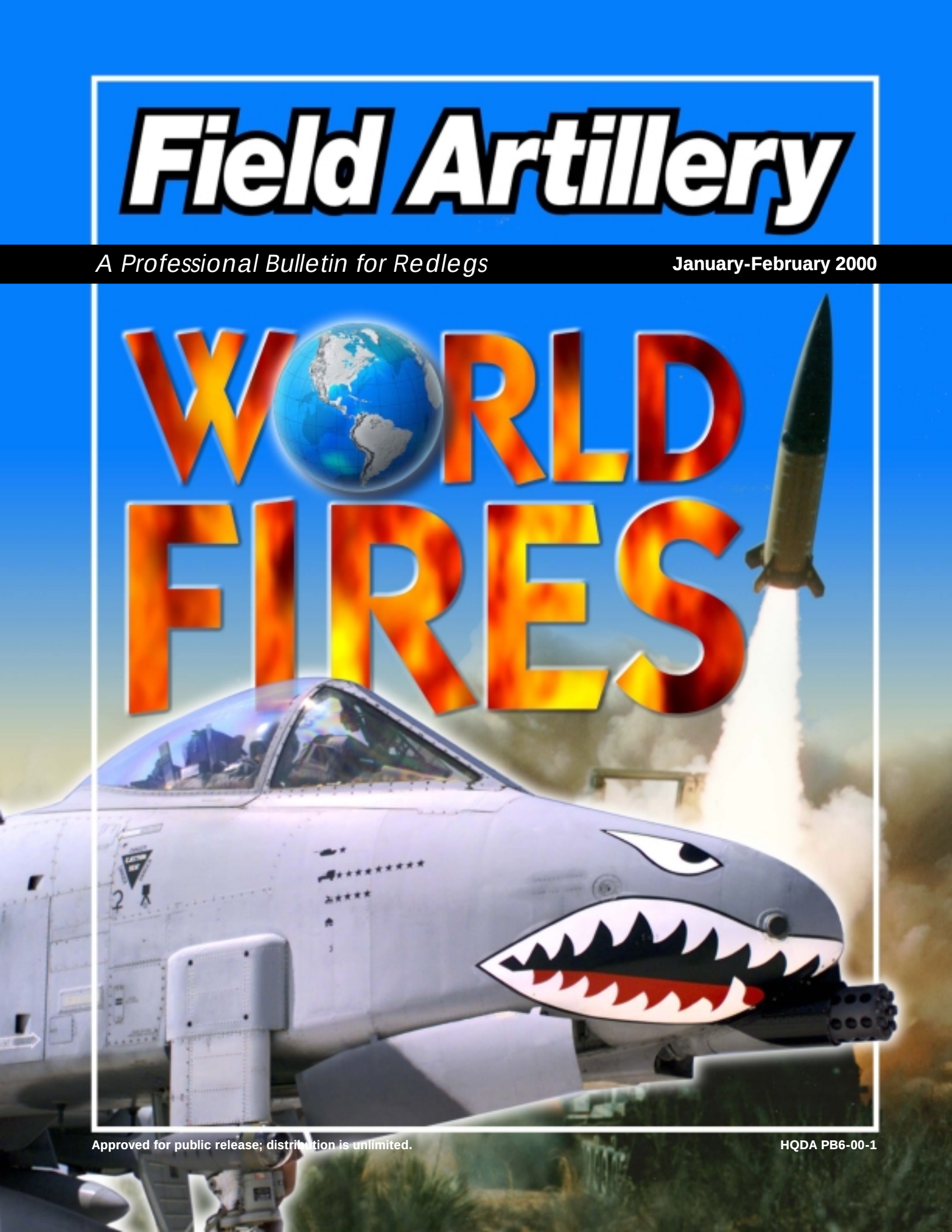
Field Artillery

A Professional Bulletin for Redlegs

January-February 2000

WORLD FIRES



HQDA PB6-00-1

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INTERVIEW

ARTICLES—World Fires

DEPARTMENTS

Front Cover: An A-10 Warthog from the 81st Fighter Squadron, 32d Air Operations Group, Ramstein Air Base, Germany, "showed its teeth" during Operation Allied Force in Kosovo. The ATACMS, shown firing, was the FA weapon of choice for Kosovo; however, 1-27 FA (MLRS), which deployed to Albania from the 41st FA Brigade in Germany, never fired a missile or rocket in anger.

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.*

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MAJOR GENERAL TONEY STRICKLIN
Chief of Field Artillery

World Fires for the 21st Century

Since the end of World War II, the United States Army has led the world in the pursuit and defense of freedom. As an Army, we have been successful in this pursuit because of our world leadership, the commitment and sacrifice of our leaders and soldiers, and our ability to develop and field the most effective doctrine and weapons systems in the world.

The Field Artillery has played a critical role in each of these areas. As a branch, we have the best leaders and the most highly trained and qualified soldiers in the world. This is our "World Fires" edition. Although many nations' systems out-range our cannons, our predominance is leveraged by a system-of-systems enabled by non-materiel combat multipliers.

Currently, we possess the most effective and lethal blend of leadership, soldier skills and doctrine in the world. Our training institutions train and develop effective leaders and skilled soldiers. However, much of our current fire support doctrine initially was developed as a function of the AirLand Battle concept of the mid-1980s. It has served us well. It helped us win the Cold War, and we used it successfully in the jungles during Operation Just Cause and the sands during Operation Desert Storm.

In an era in which the winds of change seem to blow with increased velocity, we must improve our fire support doctrine. We must address changes in our operational environment that are applicable to the entire spectrum of conflict. To remain at the forefront of world fires capabilities, we must develop doctrinal methodologies that maximize our capabilities for rapid deployment, stability and support operations, peace enforcement, small-scale contingencies, non-lethal engagements, as well as a large-scale heavy force contingency. Our doctrine must offer new flexibility and relevance for the complete spectrum of world fires capabilities.

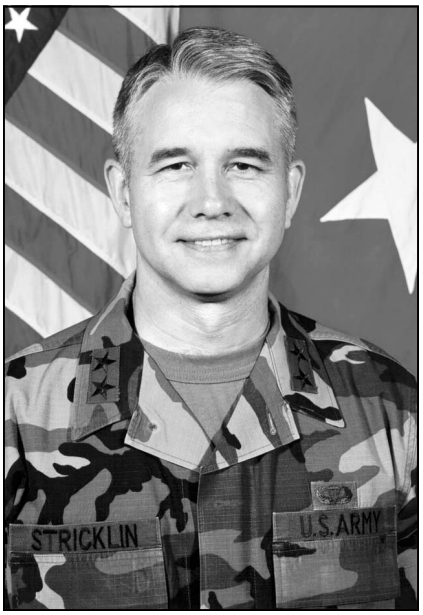
An example of a new doctrinal approach could be the consolidation of our fire support teams (FISTs) at the maneuver brigade or task force (TF) in our heavy and medium divisions. Company and battalion commanders would retain access to fire support expertise in the planning process while the FISTs would be centralized at the brigade-level for execution.

This structure may allow optimum employment of resident fire support capabilities where they can best acquire targets in support of the brigade or TF operation. A consolidated effort could provide flexibility and redundancy to meet the demands of a nonlinear area of operations and an expanded distributed battlespace. Additionally, it would maximize the brigade or TF commander's ability to influence the battle at the critical time and place.

Another doctrinal issue we must address is the application of lethal and non-lethal effects-based fire support. The notion of "effects" is a revolutionary approach that realizes the potential of *non-lethal* capabilities and their relevance to the changing nature of the threat and today's operational environment. Creating the conditions for success against an asymmetric adversary requires that we move beyond the traditional (uni-dimensional) application of lethal force to integrate other fire support elements that can generate "non-traditional" combat power.

Our doctrine must define how we can best leverage the synergy created by the employment of full-spectrum fires and effects to enable decisive combined arms operations. We must apply a desired effect to achieve a specified purpose in time and space vice simply servicing targets as they are acquired.

Currently, 11 of our 25 doctrinal publications are under revision. I have directed a review of the 11 publications for their ability to provide full-spectrum doctrine and not simply reword Cold War doctrine.



Organizationally, we will remain viable–we are involved in developing design parameters for the Chief of Staff of the Army's Initial Brigade Combat Team design to ensure the right balance of fire support and attack assets are available to the brigade commander.

Simultaneously, we are looking at design parameters for a medium division. These developments may present significant doctrinal implications.

In our quest to provide maximum flexibility to support the maneuver force commander, we must develop doctrine that enables our ability to attack across the distributed battlespace. We must be able to mass close supporting fires, fire in support of dismounted and air assault operations, employ non-lethal systems, and deliver precision munitions at close and operational ranges. Our goal is to field a spectrum of lethality that gives the tactical and operational commander the freedom to attack in every corner of his distributed battlespace.

The Field Artillery branch and the fire support battlefield operating system (BOS) are strong and viable. We are the standard other armies attempt to emulate. With wise, prudent and timely improvements to our doctrine and capabilities, we will remain in a dominant leadership position of world fires well into the 21st century.

Three Responses—"Is the FA Walking Away From the Close Fight?"

1. We Have Work to Do

The Chief of Infantry, Major General Carl F. Ernst [recently retired], asked us a very heavy and important question in his September-October article "Is the Artillery Walking Away from the Close Fight?" The title alone, of course, implies the answer. I, for one, can understand the concern raised by MG Ernst and know that we artillerymen have some work to do to assure him that when he needs us, we'll be there. But the answer to the question is complicated and involves national political considerations, risk assessment in training, and resources. First, we should ask the question more broadly—is the Army, is *our country* walking away from the close fight?

Has America walked away from the close fight? The answer is, "Yes," and we should thank *God* we live in a country that does not squander the lives of our sons and daughters. This constraint, which greatly complicates military operations, has deep historical roots.

Our national conscience was seared by the close fights and high casualties of the Civil War and World War I. As casualties mounted in World War II, we began to search for technological alternatives to the brutalities of the close fight.

In other words, our country began to walk away from the close fight in the middle of World War II. We developed and used the atomic bomb to avoid a close fight against implacable enemies on their home soil. It seemed to work against Japan, so this new technology became our way to avoid future close fights of all kinds. This new technology prompted our defense establishment to downsize forces and cut budgets everywhere—everywhere except in developing the magic technology of the future.

There are retired artillerymen who were told when they deployed with Task Force Smith in Korea that just the sight of Americans would send the North Koreans fleeing the certain destruction that would come. On July 14, 1950, the North Korean Army destroyed A Battery, 60th Field Artillery Battalion. Typical of all Task Force Smith units, of the 60 A Battery soldiers that started the battle, all but 19 were killed or captured.

Korea's legacy helped us prepare for the close fights of Vietnam, which as Harry Summers points out in his book *On Strategy*, we almost always won. Our country, however, could not stomach the casualties of the close fight, so Washington policy began to dominate until we withdrew from Vietnam in bitter defeat.

The lessons of Korea, Vietnam, and the Iran fiasco finally produced an Army and a strategy that were in synch with Washington policy—all levels clicked together in Operations Desert Shield/Desert Storm. The close fights were brief, one-sided affairs with few allied casualties. Most of the credit went to technology, particularly air and information technology, and not to the skill and training of our ground forces.

No one knows whether the American people could have stood up under the expected high-casualty rates. Press coverage of the smallest of engagements, from air operations over Iraq, to Somalia, to Captain Scott O'Grady's rescue in Bosnia suggests that our country still can't stomach the close fight. Opinion polls and subsequent policy from Washington have boxed the Army into a search for technology that can compete with the Air Force in the promise of a quick and bloodless victory—from a distance.

All branches are looking for longer range weapons, lighter more mobile vehicles, smaller organizations and flatter, information-based command and control. All branches of the Army can be accused of walking away from the close fight, including the infantry with its tube-launched optically tracked, wire-guided (TOW) missiles and Bradley fighting vehicles that hold only eight infantrymen to dismount and close with the enemy. Like it or not, air power-heavy operations and Task Force Hawk are a glimpse of the future of American warfare.

What about a future "Mother of All Close Fights?" Could we be setting ourselves up for the "Mother of all Task Force Smiths?" Yes. We may have made some unresolved mistakes or learned some bad lessons in Southwest Asia, Somalia and the Balkans. Other enemies may not be so small or accommodating.

General Ernst makes the assumption that we will have to fight another close fight, and I agree with him. As in 1950, today's technology promises a lot but may fail us. The North Koreans and the Chinese challenged our assumptions then, and they, among others, could do so again. We may find ourselves on a surprise timeline, feeding soldiers into a crisis area that gives us no choice—the fighting will be close, large, sustained and brutal.

Danger close—do we train as we'll fight? Yes, but not to the *exact* fidelity of combat. MG Ernst's article suggests that our training is in some way inadequate. One issue is that our minimum safe distances [MSDs] as outlined in AR 385-63 Training Safety don't allow us to train as we fight—are not close enough.

He refers to the closer "risk estimate distances" [REDs] outlined in a March-April 1997 article ["Risk Estimate Distances for Indirect Fire in Combat" by Major Gerard Pokorski and Lonnie R. Minton]. REDs are *combat* factors, not peacetime training factors. No training event is worth the life or limb of one of our soldiers. (I don't think MG Ernst is suggesting we accept a certain probability of incapacitation in peacetime, i.e., to kill some soldiers during peacetime training. But he is on dangerous ground.)

So, going back to the original issue, how prepared are we, the Artillery? The Artillery can train as it fights better than any other branch—we can do in peacetime almost exactly what we do in wartime. And that is close enough.

MG Ernst also implies a training problem when he discusses "…the dying art of the prep." The prep is alive and well—it's called a schedule of fires, and every artillery unit trains hard to do it.

His discussion crosses over to implying a logistics readiness problem for firing preps in combat—that current logistics concepts do not support firing preps. That point may bear some study by the logistics experts, but my experience leads me to believe that when we need the ammo, it will be there.

In Desert Storm, VII Corps Artillery planned an 85,000-round prep to support the breach of Iraqi lines by the 1st Infantry Division. Even I was astonished at the number of rounds planned. I thought, "No way the Loggies are going to pull *this* off." The ammunition was being prepositioned on schedule, but the day prior we got the word to attack about 18 hours early. We fired an abbreviated prep and off we went.

For the Artillery, much of our training and operational readiness for the close fight is a matter of good gunnery and good fire support coordination. Any direct support [DS] artillery commander will train his unit in accordance with the priorities of his supported maneuver commander. If the infantry's priority is close support, the DS artillery will train to standard.

How close is "close"? Very *close*. How ready are we mentally and physically to fire that close? Do even we artillerymen realize how close, close is, and do we have the right tools to provide such close fires? In peacetime training events, such as Combat Training Center rotations, we may use MSDs and plan for the echelonment of fires. In combat, history tells us we'll fire whatever we've got as close as it takes.

In World War II, we routinely attacked over open terrain by firing suppressive high explosives and smoke and only lifted the fires when we had closed sufficiently to get the job done with maneuver at close range (as outlined in my article "Danger Close: A Historical Perspective on Today's Close Support," October 1989). In Lieutenant General (Retired) Harold Moore's superb July-August 99 interview ["We Were Soldiers Once...The Battles of Ia Drang"], based on his book *We Were Soldiers Once…and Young*, he was asked, "How close did you call in artillery?" His answer—"You call it in where the enemy is…30 yards or less if you have to. You may take some friendly casualties, but you'll take a helluva lot more from the enemy if you don't bring your fires in close enough to do some good." His message to Field Artillerymen today: "Study and practice your trade on close, close, close-in fire support—be *real* good at it."

In this regard, we probably don't think enough about close support, don't practice it enough and aren't good enough at it. I would join MG Ernst in encouraging all Redlegs to spend more time and attention to this aspect of our trade.

Do we have the close support tools we need? The tools of close support are another matter. We, like the Army, are caught up in the dilemma of our times—we are competing for limited resources while searching for longer range and more precision to prevent the enemy from bringing the close fight to us under his conditions. If he *does*, however, and most of what we have are precision munitions, rockets and missiles, we will be in deep trouble.

With the replacement of cannon by rockets and missiles for general support [GS] units, the preponderance of improved conventional munitions (ICMs) in our basic loads, and the trend toward precision munitions and munitions centrality, we've lost some of our capabilities for danger-close fire support.

The Field Artillery will continue to pursue cutting edge technologies, such as Crusader, the M982 Excaliber 155-mm precision munition and a full range of MLRS rockets and missiles. Again, however, I agree with MG Ernst that we must be prepared for the worst to happen—and that could be close and brutal.

Our early deployers need a "Paladinized" light, towed howitzer that can fly by Blackhawk and provide close fires at longer ranges. Both heavy and light units still need an abundance of dumb old HE [high-explosive] munitions to deal with unknown and unseen threats in wooded, mountainous and urban terrain. Precision munitions won't help much in the heat of battle when the precise location of the enemy is not known. Recon by fire, suppression and final protective fires remain vital capabilities provided by massed artillery shooting at danger-close ranges. Our combat developers need to ensure that these requirements of the close fight are addressed adequately as we move into the 21st century.

Since the Senior Fire Support Conference in April 1999, there has been increasing discussion of these issues at Fort Sill, Oklahoma. Our new Chief of Field Artillery, MG Toney Stricklin, has given early and direct guidance to all of us in the Field Artillery School that we must maintain our focus on the fire support needs of our maneuver brethren who must close with the enemy. We are to have our fires when and where the maneuver commander needs them, and that includes *close*.

So, MG Ernst, we are not walking away from the close fight, but we have some work to do.

COL Thomas G. Waller, Jr.
Director, Gunnery Department
FA School, Fort Sill, OK

2. Always Remember: We're the King of Battle!

The honor of being a Redleg 30-plus years after graduation from the Field Artillery and Missile Officer Candidate School, Fort Sill, Oklahoma, may well have lulled me into a trap of doctrinal ignorance. The article authored by Major General Ernst, Chief of Infantry, "Is the FA Walking Away from the Close Fight?" pulled my intelligence-lanyard hard. Summarizing my sentiments relative to this article and its author can be done in three words... "He is *right.*"

It's hard for me to accept, much less believe, the traditions of the King of Battle have, for the sake of doctrine, become distant and digitally sanitary. Our comrades in "powder blue" clearly have depended on us to put steel on the targets and plow the ground in advance of and during a unified ground attack.

As a lieutenant in Vietnam in command of an FA detachment, I regularly found myself performing duties as an aerial and forward observer. My unit and I roamed the Ashau Valley, spending many interesting interludes with collocated infantry platoons. When we occupied any new defensive position or firebase, one of my first missions was to survey, plot and fire in my final-protective-fires, registering them with the firing battery supporting me. These were, by their very nature, "danger close" missions, something I was trained to do in support of the defensive concept. I adjusted 105-mm, 155-mm and even 8-inch batteries, bringing their shells as close to our wire as was reasonable. Then, while I was firing harassing and interdicting fires, my counterpart in the infantry was busy establishing interlocking fire from his machine guns and placing his listening posts along the most likely paths of approach by the enemy. In short, we worked as a team: "crossed cannons" and "crossed rifles."

In the attack, the same spirit of cooperation held true. The "gravel agitators" and my troops saw firsthand, up close and very personal, the awesome power of a 155-mm battery responding to my

call for "Hotel Echo, 100 Up," followed by fire-for-effect on the deck. While we moved forward, that supporting battery gave us that "steel curtain" mixed with other munitions. The joint goal was and remains very simple: you afford the enemy you're facing the maximum opportunity to *die* for his country.

To my knowledge, no theory, computer or high-performance aircraft ever seized and held the high ground. To be sure, in today's combat environment we can engage hostile targets from incredible distances. We can wipe out an enemy's offensive air assets, neutralize his electronics, smash his missiles and make infantry swimming pools out of his infrastructure. There comes a moment, however, when that one infantryman stands up, locks and loads and moves out to finish the job—*up close and personal*. To suggest or even consider that the mobility and massed fires of the Field Artillery along with trained forward observers shouldn't be part of the "close with and overcome" equation is ignoring over 200 years' experience.

I acknowledge I'm an old warrior from a different era. I'm at the low end of the knowledge curve when it comes to digitized tracks and all this high-tech doctrine. I'm sure when it works, it blows away the fog of battle and does great things.

Yet, when the Chief of Infantry, in essence, asks us Redlegs to remember our proud history of supporting the infantry, perhaps it's time to put down our spreadsheets, drain our think tanks, put all the high-tech gadgets in perspective and get back to the fundamental reason our branch earned the right to be called the King of Battle—steel on target, any time, anywhere!

K. Douglas Cook, Public Affairs Officer
US Army Training Center & Fort Jackson
Fort Jackson, SC

3. "Close" Means 50 Meters

So many thoughts and feelings were generated by the very fine article "Is the FA Walking Away from the Close Fight?" by Major General Ernst. My having served as a rifleman for General Patton at a time when we needed every round of artillery fire that we could get makes me appreciate your article more than I can find the words to express.

I was a rifleman in World War II in the 376th Infantry Regiment of the 94th Infantry Division, including at the battles of Saar-Moselle Triangle along the Siefried Line against the 11th Panzer Division. There, we took 500 percent casualties in our rifle squads. My squad leader and I served for seven of the 11 weeks of that time. Together, we hold the record for longevity in my squad.

I surely hope the current FA community becomes more realistic in its ideas of the placement of artillery fire. The FA community has been unrealistic for many years. Please note the comments in my article in the November-December 1984 *Field Artillery Journal* [Page 9]. In it, I discuss aspects of the close fight, including artillery effects and preparations, as relevant to the January February 1984 article "Keep the Fires Burning." But the comments also support General Ernst's arguments.

"One recurring misconception pops up again and again in [the article] and that is the confusion between safety limits for peacetime exercises and wartime safety limits.

"The author states, 'The FPL (final protective line) is normally located 200 to 300 meters in front of the company, and so the indirect fire will...be spotted dangerously close to friendly troops.' In combat, there are reasons for placing the final protective fires, including those from artillery, some 200 to 300 meters to the front, but troop safety is not one of them. To this one-time Third Army rifleman, anything over 50 meters might be dangerously distant....

"The line of departure for the enemy counterattack is normally the next line of concealment, which is often as close as 200 to 300 meters away. From the time we see the enemy leave his line of departure until he is on our positions may be only 20 to 30 seconds. One hopes that the word of the counterattack and our call for final protective fires can get back to our supporting battery in maybe 10 seconds, that the field artillerymen can slam a round into the chamber in maybe five seconds and that we can get a burst on the ground in front of us in a total elapsed time of maybe 20 seconds. By that time, the attacking enemy might be within 50 meters of us, and that is where the shells need to land....

"To think in terms of having only one battery support a company when final protective fires are needed is pitiful, but it could happen. Six or eight artillery shells exploding across a company front every 10 to 15 seconds is pathetic as far as supporting fires go—it is worth shooting, but by itself, it is just an inconvenience for the attackers. It would take two or three battalions of artillery to stop an attack over the area of a company front by artillery fire alone....

"In one attack on a company-sized objective (a small town which was a strongpoint in the Siegfried Line), my company was supported by a 5-minute time-on-target preparation fired by eight battalions of artillery. That was maybe 140 tubes firing over 3,000 rounds. Under cover of the smoke and dust raised by those shells, we closed to within about 50 meters of the shell burst, waited for the shell smoke, which was the last shell fired, and then occupied the town....Most of the defenders left out the back edge of the town as we were coming in the front edge. The remaining defenders were pretty well dazed, and those we simply rounded up and sent to the rear. There were casualties among the defenders, but not nearly what might be expected from 3,000 rounds of artillery. The margin of victory is almost always paper thin. Among other things, let us keep our evaluation of the effects of our artillery fire realistic."

LTC(R) Robert P. Kingsbury, FA, USAR
Laconia, NH

"A Tribute: The highest honor that could possible be paid the artilleryman is respect and gratitude from his infantry buddies with whom he worked.

In February 1945, when troops of the 376th Infantry [94th Division] were coming out of the line, they marched in single file past the battery position of Battery A, 356th Field Artillery Battalion. They glanced over and saw the artillery guns in position and the cannoneers standing by.

One by one, each Doughboy in the column took off his helmet and brought it to his chest.

One infantryman broke a smile across an ice-caked, bearded face and said simply: 'Thank you.'"

Taken from *History of the 94th Infantry Division in World War II* edited by Lieutenant Laurence G. Byrnes, The Battery Press, Nashville, Tennessee.

Response to "From Horses to Tractors: Implications for Army XXI"

I am a 75-year old World War II artillery veteran of the 9th Infantry Division in the ETO [European Theater of Operations] (US First Army), and both my father and father-in-law were BCs [battery commanders] in France during WWI. So I related very much to the most interesting, well-researched article by Major John D. Hall in the November-December 1999 edition. And that picture of WWI artillerymen and their French 75, caisson and horses surmounting a rugged hill was great.

One note I would make is to the reference to Kasserine Pass in the article. That battle there truly was a "terrible failure," but not due to lack of motorization. In fact, the German onslaught was stopped dead in its tracks in the next few days by the motorized artillerymen of the 9th Infantry Division who had made a desperate forced march. I wrote an article on this event (unpublished) and would be glad to send it to the author, if he has any interest.

Robert C. Baldridge, FA
2LT (1943-5), 34th FA Battalion
9th Infantry Division
Lawrence, NY

AFATDS Update

New Organization Represents Soldiers in the Field. Last October, the office of the Training and Doctrine Command (TRADOC) System Manager (TSM) for the Advanced Field Artillery Tactical Data System (AFATDS) combined with the Tactical Software Division (TSD) of the Directorate of Combat Developments (DCD) in the Field Artillery School, Fort Sill, Oklahoma, to create TSM-FATDS. This reorganization places responsibility for the requirements, management and oversight of *all* digital fires command and control (C^2) systems under a single agency.

By combining all C^2 systems, it will be easier for units in the field to provide input and/or seek answers to digital systems' hardware, software or fielding issues. The systems are AFATDS, the initial fire support automation system (IFSAS), battery computer system (BCS), multiple-launch rocket system's (MLRS') fire direction system (FDS), forward observer system (FOS), Firefinder, meteorological measuring system (MMS) and lightweight tactical fire direction system (LTACFIRE).

The TSM offices are on the second floor of Knox Hall, Building 700, Fort Sill. Phone numbers are commercial (580) 442-6836/6837/6838/6839 and 442-5719/6067. The DSN is 639. TSM-FATDS maintains a 24-hour software hotline at (580) 442-5607 (or DSN 639).

AFATDS FY00 Fielding. Several units are scheduled for new equipment fielding or hardware/software upgrades during FY00. AFATDS software Version A98 is currently being fielded. Three brigades—17th FA Brigade (FAB), 214th FAB and 75th FAB, all in III Corps Artillery, Fort Sill; 18th FAB, Fort Bragg, North Carolina; and 10th Mountain Division (Light Infantry) Artillery, Fort Drum, New York, are scheduled for fielding this FY. They will receive new hardware, software and C^2 vehicles and turn in their old equipment at TM-10/20 standards.

The 82nd Airborne Division Artillery, Fort Bragg, and 101st Airborne Division (Air Assault) Artillery, Fort Campbell, Kentucky, will undergo retrofit. Retrofit is the upgrading of hardware and software and includes training to operate and sustain the new equipment.

In FY00, selected Army National Guard (ARNG) units—196th FAB (TNARNG), 197th FAB (NHARNG) and 45th FAB (OKARNG)—will receive a new material briefing for Version A98. The briefing tells what equipment will be turned in and issued, how new equipment training (NET) is conducted and dates of the fieldings.

The legacy systems (FOS, FDS, BCS, MMS, LTACFIRE, IFSAS and Firefinder Q-36/Q-37) received a major revision in their messaging systems in the new "Package 11." This improved package is being fielded worldwide to Active Component (ACs) and Reserve Component (RCs) units through June.

Before fielding, units should read the article "Plan for AFATDS NET" on Page 27 of the September-October 1998 edition. The article outlines lessons helpful in preparing for AFATDS NET.

MAJ A. J. Williams, FA
TSM-FATDS, Fort Sill, OK

"USS Redleg"

The "Redleg," a sea-going motor yacht, sits in Boston Harbor, Massachusetts. Redlegs experience her magnificent views of Boston in the summer months during staff calls and coordination meetings with other headquarters in preparation for Warfighter exercises and annual training. She winters in Fort Lauderdale, Florida.

Her owner, Colonel Gary A. Pappas, commands the 42d Division (Mechanized) Artillery, Massachusetts Army National Guard, headquartered in Rehoboth. Colonel Pappas is a Boston attorney with a window view of his yacht from his office.

The "Redleg" is berthed within sight of the *USS Constitution* at the Charlestown Naval Shipyard, which serves as a reminder of why her 42d Division Redlegs serve the Commonwealth of Massachusetts and the nation.

Lieutenant General Kevin P. Byrnes
Former Commander, 1st Cavalry Division, Fort Hood, Texas

Responsive Fires for the Maneuver Commander

Interview by Patrecia Slayden Hollis, Editor

Q As a former division commander, do you share the perception of some maneuver commanders that the FA has walked away from the close fight?

A Yes, in many respects, the FA has walked away from the close fight. Why do I say that? I just look at our doctrine, training and how much we've invested in fire support—in the equipment we've put in our soldiers' hands and the simulations we've developed to train him to fight the close fight.

For example, you can go to the National Training Center [NTC, Fort Irwin, California] and see great soldiers and leaders dealing with complex challenges and sometimes failing. When you get into where we need to improve, the answers are clear. Fire supporters don't have the communications gear they need—radios with the power and range to call for fires, adequate power sources for their night sights or G/VLLDs [ground/vehicular laser locator designators]. You also can back-track weaknesses at the NTC to a home station training program that lacks effective fire support integration because the unit doesn't have the simulations to do it.

Units really can't replicate the combined arms fight with totally integrated fire support at home station without simulations. I've tried to help FISTs [fire support teams] to visualize mounted operations. I once put 90 wheeled vehicles on the ground moving 20 kilometers an hour to replicate an enemy regiment; the force had GPS [global positioning system] as the lead trail and fire markers to try to measure indirect fire accuracy and effects. I put FISTs out in the defense—multiple observers out on the battlefield. The intent was to give our FISTs an experience, pre-NTC, pre-war, in attacking large, moving formations over extended distances.

We got a lot of benefit out of that training: we had to deal with communications problems, the overloaded FDC [fire direction center] had to work multiple tasks, etc. It was a basic type of exercise that units should do a lot of to get ready for the NTC and war. But we just can't afford the time or resources to do that type of training. To compensate, we need better simulations. We must train needed skills in simulations like our maneuver brothers do in CCTT [the close combat tactical trainer].

If you look at the array of simulations available to train crews and leaders to conduct maneuver warfighting, it's phenomenal. Each simulation serves as a gate to the next event in the training strategy; the gates do the job very well.

Now look at what we have to train our fire supporters—we're broken. We don't have simulations that support our great 13 Foxes [Fire Support Specialists] and their leaders at home station. They work very hard to train their fire support skills at the individual and crew levels. Our FIST teams go out on platoon and company STXs [situational training exercises] and battalion FTXs [field training exercises], but that's not enough. We just can't afford the amount of live training needed at home station to set fire supporters up for success at the NTC and to win in combat.

We need a fire support trainer with CCTT-like software, much like the state-of-the-art arcade games you see in shopping malls. The simulations we give our fire supporters to train on in garrison use 20-year-old technology. We've got to do better.

Just like maneuver, our simulation training sequence ought to be gated. We need some purely fire support simulations to practice the "blocking and tackling" level tasks. Then units can certify their FISTs (or COLTs [combat observation teams]) in the field with live fire. And by-the-way, individual- and crew-level certification should be the last time our FISTs fire at a *stationary* target. Firing at piles of "red junk" doesn't set you up for success in war—which has been demonstrated time and again at the NTC.

For collective training, we must continue to fully integrate fire support into all live training but also get into collective-level simulations that allow fires to play as part of the team.

Back to the close fight—we sometimes pay too much attention to the *delivery* of fires at the expense of our role and responsibility in the world of fire support. The "delivery of fires" is critical but is really an entry-level requirement.

The maneuver commander has to assume the FA is going to get the cannons

and rockets in the right position and deliver FA fires when and where he needs them, much like we assume an F-16 pilot can fly the plane as he goes out on a mission. At that point, his job is to *fight* his weapon. The DS [direct support] battalion commander must seek a balance in training, ensuring that delivery-related training is synchronized with fire support requirements.

We also should seek to improve how we represent the fire support community to the maneuver commander. Fire support is not hard. We must be able to quickly deliver fires where the commander needs them in accordance with the standards developed in our MTPs [mission training plans]—planned fires or targets of opportunity.

The NTC is the test; it's the toughest, most realistic playing field in the Army, short of actual war. Fire supporters can't allow our system to become too complex or overburdening. This results in a constipated system that doesn't deliver. FA leaders must seek every opportunity to streamline internal processes in fires planning, preparation and execution. I'm convinced we do a lot of harm to ourselves by getting too technical at times.

I also recommend focusing on what we *can* do as opposed to what we *can't* do. We've all witnessed counterproductive discussions. As an example scenario: the engineers recommend some deep obstacles to delay the enemy force, so the Field Artillery must fire FASCAM [family of scatterable mines]....

"Sir, while I'm firing FASCAM, I can't provide obscuration." (Sure he can.)

"Will you need all six batteries to fire FASCAM [the DS battalion's and reinforcing battalion's batteries]?"

"Well, no Sir. But one's a counterbattery unit."

"Can't you give it some planned fires, and then when you get an acquisition or identify an artillery unit moving into position, *shoot it* and go back to firing other targets?"

The point is, fire supporters must understand the commander's intent and be flexible enough to accomplish the mission.

As artillerymen, we sometimes get a reputation for fixation on "the plan." We have a solid reputation for precision and accuracy, but we're killing ourselves in the planning process. We put too much time and energy into it. And once we cross the LD [line of departure], there's an expectation that the battle is going to go according to the plan—we'll execute the targets we so carefully sequenced, planned and rehearsed.

"We must train needed skills in simulations like our maneuver brothers do in CCTT [the close combat tactical trainer]."

Planning is critical to success, but when the enemy doesn't come at us exactly the way we think he will, we've got to be flexible. We must adapt to a thinking enemy.

Fire supporters must keep things in perspective. They have to be able to react to targets of opportunity—and there *will* be targets of opportunity on the battlefield from minute to minute.

Then Lieutenant General [Crosbie E.] Saint [III Corps Commander] said it best in his *Field Artillery* interview in the late 1980s ["The Key to FA—Focusing Combat Power, October 1988]. To paraphrase him, he said he wanted to be able to focus his fires like a flashlight beam on one area at a time—not a lot of little beams, but one light shining where he wanted it. And then he wanted to be able to move his flashlight to shine on another set of targets—one beam.

So the fire supporter's answer to the maneuver commander when the commander asks for unplanned, unrehearsed fires is...."Roger, out. Shot, over."

Now, I'm not advocating the FA shift to freewheeling fires or artillery hipshoots. But when the enemy chooses to by-pass our obstacle or choke point, we have to shift fires. If a target isn't planned along the enemy's route, we better come up with a way to kill him.

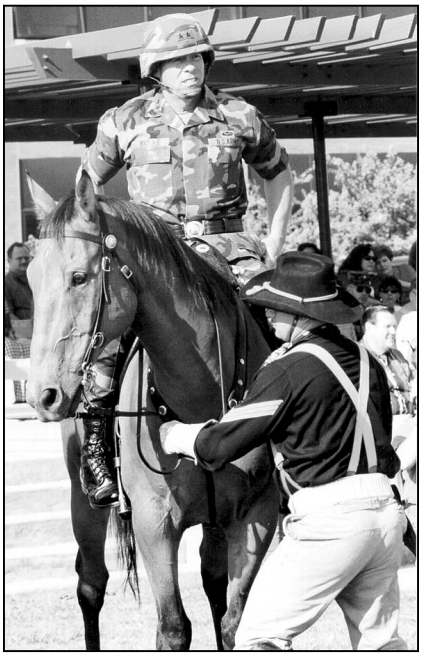
Commanders have to drill their units to be responsive and flexible. You know—like the football two-minute drill. Then the units are trained to do anything the maneuver commander wants. It starts with understanding the commander's intent and how he's going to fight it.

I also think we need to relook and update our fire support doctrine. At least part of the reason our doctrine is outdated is because the Army has continually cut the manning levels of our schools. We've had to put Army resources in the most critical areas, our units, and have taken some risks in doctrine.

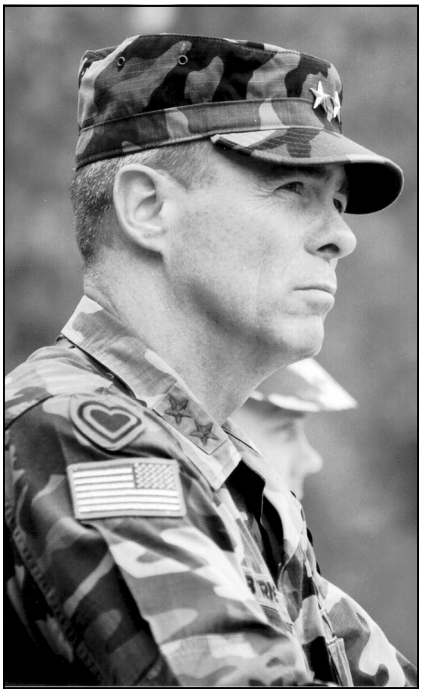
In the 1st Cav, when my fire supporters wanted to find out how best to support a particular type of mission, say, a breaching operation or river crossing, they'd go to maneuver doctrine or core publications. Shouldn't they first be going to the 6-series [Field Artillery] publications?

The lessons we learned at the NTC are extremely valuable. Rotations at the NTC are a critical investment, and we learn a lot about brigade-level operations. The fire support lessons we've learned at the NTC need to be plowed into our doctrine—not just into the Center for Army Lessons Learned [CALL] bulletins. The field can help—there are a lot of great "how-tos" that have been developed that have doctrinal implications.

Now, before I go any further, let me tell you what's right with the FA. The great strength of the Field Artillery is our people. They are the best I've seen in my 31 years in the Army.



Major General Byrnes on traditional horse back relinquishes command of the 1st Cavalry Division at Fort Hood, 20 October.



Our Field Artillery soldiers are often the professionals behind the scenes, seeking no fanfare, just quietly and deliberately executing their tasks to very high standards. Field Artillery NCOs are and always will be the standard bearers for our branch and Army.

I have spoken a lot about home station and the NTC; but, most recently in Bosnia, I watched young soldiers perform way beyond our highest expectations everyday. Today's soldiers want to do their jobs—want to do great things.

In Bosnia, soldiers went out the gate everyday in an uncertain environment, totally focused and ready, trained and led by a first-rate corps of NCOs. It was a great environment to watch NCOs take charge and get the mission done to standard daily.

The Field Artillery School has consistently excelled in providing institutional training for these soldiers and leaders. The school sets the base line. We are blessed with quality soldiers well-grounded in the basics when they come out of the schoolhouse.

Q *What are the fire support challenges at the company and battalion levels?*

A I think we need to take a look at how we support the company in our heavy forces. (Our light forces have it about right.) Without question, we should always be prepared to provide the company fire support, but the question is really whether or not we place all FISTs at the company level or consolidate them at a higher level and task organize dependent on METT-T [mission, enemy, terrain, troops and time available]. Perhaps we should consolidate our FISTs at the brigade level like we've done with the COLTs.

"Perhaps we should consolidate our FISTs at the brigade level like we've done with the COLTs."

It has been my experience that when a FIST is employed with a company, it's often out of the fight. The company commander is very busy with his own piece of the battle. He's not focused on positioning his FIST to gain best advantage. The FIST chief, a lieutenant or sergeant, must get himself into the best position on a very confused battlefield, often at night or under limited visibility conditions.

At the brigade level, the commander could get "his eyes" out on the battlefield integrated with his other collection assets. His FISTs consolidated at the brigade level would give him more flexibility to see the fight and connect sensor-to-sensor and then link the final sensor (COLT or FIST) to shooters.

I believe the more centralized approach to observation planning has a lot of merit and may be the way to go.

We also could be more precise about the role of the S3 in the DS FA TOC [tactical operations center]. Like the FIST, the FA TOC cannot be out of the fight. In DS TOCs, the battalion S3 closely monitors the fight. He's the officer who *fights* the DS battalion under the direction of the DS battalion commander. He listens to the maneuver brigade command net and his DS command net and is in constant contact with the DS battalion commander about how the fight's going.

The DS TOC is *in* the fight. The S3 is hearing firsthand observations over the maneuver command net and can anticipate fire support tasks. He knows if the fight is on or off plan. He also can give his battalion commander a stream of options as the battle develops.

His DS battalion commander is next to the brigade commander in, most likely, a confused environment. He is in an M113 in the best position to direct fires, at least for the main effort. He also is ensuring the S3 is keeping the CFZs [cri-

Major General Brynes with 1st Cavalry and allied soldiers and a government official in Bosnia.

tical friendly zones] in the appropriate places, the batteries in position, ammo requirements updated, etc., etc.

The S3 is most likely in a little less confused environment. He can gather a moment to think and provide his commander the information he needs to know. That's an S3 that keeps his battalion in the fight.

However, too often the maneuver brigade command net is on over near the FDC or, at best, in the S2 shop where the battalion S2 is listening to the O&I [operations and intelligence] net. In this TOC, the S3 is *out* of the fight. He's either reacting to moving his batteries according to the plan or events he's hearing in calls-for-fire or he's just taking instructions from the DS battalion commander.

The S3 needs to focus on what's happening on the maneuver net, anticipating requirements and bringing batteries to a higher level of readiness when they have to make a move that's not on the plan. He needs to be situationally aware of what's happening in the brigade fight *all the time*.

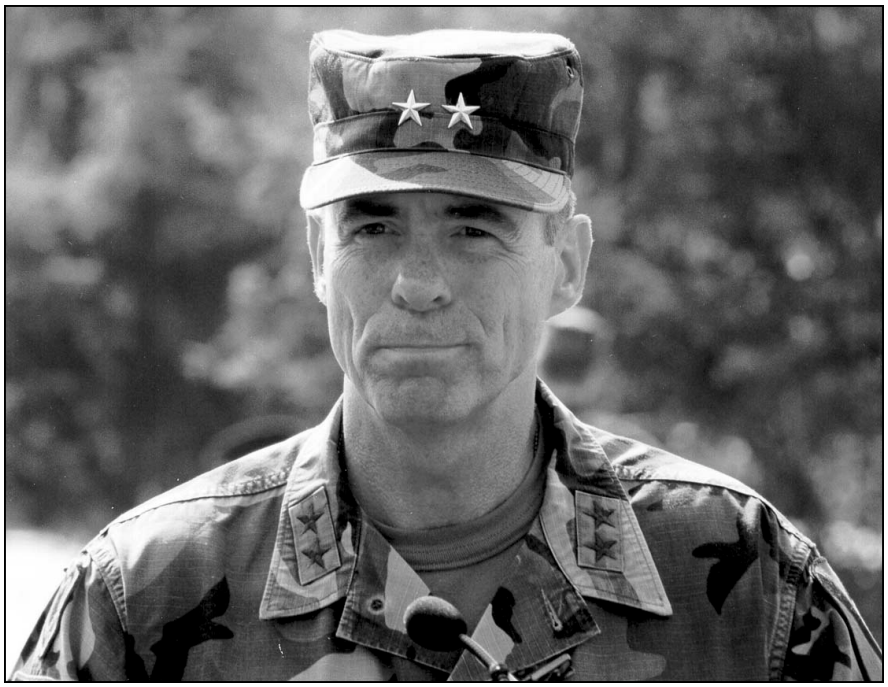
And that should be true of the reinforcing FA battalion TOC as well. That reinforcing TOC is not there for counterfire. It's there to reinforce the fires of the DS battalion. The DS battalion commander has *six* batteries in the fight, not just his three. No tube should be idle in a fight.

I also would toughen the conditions of home station training by forcing communications over extended distances. Artillerymen should never underestimate the value of retrans [retransmitting] FM signals. Home station training areas are much smaller than the NTC or likely future battlefields. In war, the unit probably will have to deal with intervening terrain features that will prevent it from communicating and the best, most thoroughly rehearsed plan will fall apart.

Q *What do we need to improve at the brigade level?*

A Fire support wise, we do well at the brigade level. The brigade FSO [fire support officer] is properly organized to do the job, and COLTs at that level is a great concept.

But we've got to do better with the COLTs' equipment. Take our dismounted COLT—we kick him out of a helicopter in the middle of the night with 80 pounds on his back, mostly in batteries, and the G/VLLD, night sight…old technology. He backpacks through tough terrain, up and down hills, avoiding detection because the enemy is looking for him. He gets into position. He sets up redundant communications because a lot of our communications gear isn't as robust as it could be, plus he faces terrain interference or lack of secure comms. We must make this easier.



This great soldier may see the brigade commander's most critical target, but he may not be able to communicate that he sees it because of his equipment or lase the target for a waiting Copperhead shot because he lacks battery power. Now, I know we have some improvements coming, such as new hardware that will solve some of those problems. But we must make the COLT's load lighter and his equipment more effective.

Otherwise, brigade-level fire support is about right.

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

A We've got a reputation for precision, standards and discipline that we've upheld for two hundred years, and that's something to be proud of. The maneuver community calls artillerymen "the smart guys." It's a great reputation to have.

Stay focused on our mission as the King of Battle. We exist to support the ground commander with flexible, responsive fires—whenever and wherever he needs them. Keep training smart, and I know we'll be ready when needed.

★★★

Lieutenant General Kevin P. Byrnes, until recently, commanded the 1st Cavalry Division at Fort Hood, Texas. Currently, he is the Assistant Vice Chief of Staff of the Army at the Pentagon. Among other assignments, he served as the Director of Force Programs in the Office of the Deputy Chief of Staff for Operations and Plans on the Army Staff at the Pentagon, and Assistant Division Commander plus Chief of Staff of the 1st Cavalry Division. From the latter position, he went on to command Joint Task Force Six at Fort Bliss, Texas. Lieutenant General Byrnes served as Director of the Strategic Outreach Initiative and Director of Political and Economic Studies, both at the Army War College, Carlisle Barracks, Pennsylvania. He commanded the 4th Battalion, 3d Field Artillery in the 2d Armored Division (Forward) in Germany. He holds a Master of Arts in Management from Webster University.

"Hog Walk"-A-10s of the 81st Expeditionary Fighter Squadron, 32d Air Operations Group

Lessons Learned from Operation Allied Force in Kosovo

by Lieutenant Colonel Robert S. Bridgford, Major Neil S. Hersey, AV, and Lieutenant Colonel James E. Varner

The airmen and soldiers who executed Operation Allied Force, the air campaign to liberate Kosovo, achieved their mission. Serbian forces are out of the province, displaced Kosovar Albanians have returned to their homes and peacekeeping forces have deployed and begun the process of stabilizing the area.

This article discusses lessons learned by the US Army Europe's (USAREUR's) Battlefield Coordination Element (BCE) during Operation Allied Force—lessons useful to fire supporters working in a joint environment. (The BCE is an echelons-above-corps organization recently redesignated as a battlefield coordination detachment or BCD.) The USAR-EUR BCE at the Headquarters of the US Air Force Europe (USAFE) on Ramstein Air Force Base, Germany, was involved in planning for what would become Operation Allied Force since its genesis in 1998.

On 23 May 1998, the 32d Air Operations Group (AOG) at Ramstein was tasked to develop an air campaign to compel the Federal Republic of Yugoslavia to desist its repression of Kosovar Albanians in Kosovo. The initial absence of a ground component left the BCE as the ground force representative in the air campaign planning process. On 24 March 1999, Operation Allied Force began. The BCE was already deployed with the combined air operations center (CAOC) at Dal Molin AFB, Italy, in support of Task Force (TF) Able Sentry in Macedonia.

On 9 April, the deployment order to Albania came for TF Hawk, a V Corps contingency force consisting of attack aviation, a multiple-launch rocket system (MLRS) battalion—1st Battalion, 27th Field Artillery—and maneuver forces. This shifted the BCE's focus to TF Hawk with the mission of supporting the Army force (ARFOR) under Joint Task Force Noble Anvil, the US JTF under the broader NATO effort.

The BCE sections were integrated throughout the combined forces air component commander's (CFACC's) staff. BCE functions included air tasking order (ATO) development; target development for the guidance, apportionment and targeting (GAT) and master air attack plan (MAAP) processes; airspace management and deconfliction; air defense coordination; intelligence collection and development; and ground liaison team (GLT) support for fighter squadrons deployed in England, Germany and Italy.

The BCE coordinated the airspace and air support requirements for TF Hawk in Albania while the CAOC's Flex Targeting Cell simultaneously targeted Serbian fielded forces in Kosovo. In the latter part of May, TF Hawk shifted its focus from deep attack training to targeting Serbian forces in Kosovo.

The V Corps Deep Operations Coordination Cell (DOCC) began submitting target nominations derived from Q-37 Firefinder radar reports and information gleaned from other sources. These targets greatly increased the effectiveness of Kosovo engagement zone operations. NATO air forces were bet-

ter able to focus their efforts, resulting in the highest levels of destruction of Serbian fielded forces in Kosovo achieved during the war. The air campaign of Operation Allied Force ended on 9 June.

Intelligence Lessons

"The BCE intelligence section serves the BCE and the JOAC [joint air operations center] as a one-stop COMARFOR [commander ARFOR] land warfare intelligence liaison. The BCE's intelligence function is that of liaison and coordination, not that of an ACE [analysis and control element]. The BCE intelligence functions include, but are not limited to, the following: relaying real-time significant intelligence received from collection platforms and sensors to the JAOC; coordinating emerging target information with the ARFOR TOC [tactical operations center] and validating them for diverts; obtaining the most current enemy ground force situations from the ARFOR G2 operations sections and interpreting that enemy ground force situation; and getting the priority intelligence requirements (PIRs), collection plan, targeting data, 24 to 96 hour enemy situation projection, and nominations for reconnaissance and intelligence EW [electronic warfare] support from the ARFOR G2 Plans sections." (*FM 100-13 Battlefield Coordination Detachment (BCD),* 5 September 1996, Pages 2-4 and 2-5.)

Allied Force was unique in many ways, foremost of which was the CFACC's executing the ground war from the air—in essence, a movement-to-contact from 15,000 feet above ground level. To execute this task in an area the size of Kosovo required detailed ground intelligence preparation of the battlefield (IPB); continuous timely intelligence on enemy ground forces from the land component commander (LCC); effective intelligence automation systems; and a coordinated intelligence, surveillance and reconnaissance (ISR) collection strategy. These requirements were not met consistently.

Intelligence Support Structure. In a traditional combined task force (CTF) operation, the air component and land component headquarters work hand-in-hand. The LCC has the intelligence support structure needed to develop the enemy ground order of battle, identify enemy vulnerabilities and offer possible courses of action. The ground commander pushes the intelligence to the CFACC through the BCE intelligence section, providing clarity of the enemy ground situation. The LCC drives the focus for collecting, tracking, targeting and attacking enemy ground forces.

The air component headquarters, in this case the CAOC, traditionally runs the air campaign. Its intelligence support structure focuses on developing fixed targets for air assets to service. The Allied Force CAOC did not have the ground intelligence structure to perform detailed IPB and relied on the analyzed intelligence relayed through the BCE from the LCC's organic intelligence element.

TF Hawk had the only intelligence organization in Operation Allied Force with the expertise, experience and manpower to provide adequate resolution of the ground picture and a detailed IPB—the V Corps G2 ACE. This organization could have enabled a much more rapid sensor-to-shooter response and allowed daily operations to be planned based on detailed predictive analysis rather than as one would execute a hipshoot. The analysis could have identified targeted areas of interest (TAIs), high-value targets (HVTs) and high-payoff targets (HPTs) up to 96 hours in advance.

The CAOC Ground Analysis Cell tried to fill the void as the TF Hawk ACE/G2 focused solely on developing targets for Apache helicopter engagement areas in Kosovo. After realizing that the Apaches would not be employed in Allied Force, TF Hawk began to nominate targets to the CAOC through the BCE.

For a CAOC ground analysis, targeting and fusion cell to support an air campaign against ground forces, it must be fully supported by the land component ACE's shared intelligence products through the BCE.

Security Classification. This was another major hindrance to the use of TF Hawk intelligence products. The CAOC's Ground Analysis Cell operated by NATO rules. TF Hawk classified its information (friendly and enemy) as "US Only, Originator Control." This meant the TF controlled who could access specific pieces of information within US-Only channels.

The CAOC Ground Analysis Cell could not use any intelligence summary sent by the TF Hawk ACE, depriving the CFACC of a common enemy ground picture that joint doctrine requires. It also deprived the Ground Analysis Cell of an extremely detailed picture of the enemy, thus degrading its targeting capabilities.

Intelligence must support the operational commander. Allied Force was a NATO operation. A common classification on enemy information between the CFACC and LCC is essential for mission success.

All-Source Analysis System (ASAS). During Operation Allied Force, the ASAS remote workstation (RWS) added little to the critical functions of the BCE Intelligence Section and the CAOC Ground Analysis Cell, despite its capabilities. The ASAS-RWS depends on the LCC G2's ASAS suite to push database information in different formats. The

An ammo handler prepares to load a CBU-87 bomb on to an A-10 before the use of cluster bombs were restricted in Operation Allied Force.

ASAS suite gets its information from various external links and assets through the all-source and single-source elements and also can be updated manually by operators.

In this operation, the TF Hawk ACE did not deploy with its complete doctrinal ASAS suite. It took only three ASAS-RWS machines and used them only as servers and database "pulls" from the 66th Military Intelligence (MI) Group. The data transfer from the 66th worked well, but TF Hawk never transmitted its own updated database to any supported or subordinate unit over ASAS. Subsequently, the BCE and others never got a "red" update from the LCC over the ASAS—the doctrinal Army intelligence system. Dissemination of TF Hawk intelligence products only came over the US secure Internet protocol net (SIPRNET) or the joint deployable intelligence support system (JDISS).

ASAS is a tremendous asset, but it must be used by all Army intelligence elements if it is to be effective in intelligence dissemination and target development.

Unmanned Aerial Vehicles (UAVs). The success of Allied Force highlights the effective employment of ISR assets, particularly UAVs. However, significant controversy over tasking and employing the Hunter UAV degraded its effectiveness. Before TF Hawk assumed tasking authority and operational control (OPCON) of Hunter, the National Collection Management Cell (NCMC) and Collection Coordination and Intelligence Requirements Management (CCIRM) integrated all UAVs and drones (US and NATO) into an orchestrated collection effort. They used the planned imaging day (PID) and current imaging day (CID) processes, involving US theater, national and NATO target deconfliction. The process ensured efficient, non-redundant coverage and maximum support available for theater collection.

Once TF Hawk assumed OPCON, Hunter began operating outside of the PID/CID cycles and the rotations of other NATO and US-Only surveillance systems, often creating gaps in coverage. Had Hunter remained in the rotation under national rather than local control, continuous coverage of key target areas could have been maintained.

Hunter's schedule also was not consistent with the combat sortie schedules. This lack of sensor-shooter synchronization created circumstances when targets could not be struck in a timely manner because no strike aircraft packages were available.

Common mission requirements and limiting geography in this theater required centralized, integrated control of the ISR force. In future operations, tasking authority for all US UAVs should be retained at the operational level. Hunter still should be allocated to the tactical commander for day-to-day operations; however, higher echelons should maintain tasking authority.

Operations Lessons

"The BCD Operations section focuses on current operations (0 to 24 hours out). The operations section monitors execution of the current ATO in regard to sorties planned against ARFOR nominated targets and coordinates with the ARFOR TOC, DOCC, TMD [theater missile defense] cell, and JAOC on canceled, diverted, or re-roled missions planned against ARFOR targets. The operations section coordinates with the JAOC combat operations division on ARFOR immediate requests for AI [air interdiction], EW, PSYOP [psychological operations], and reconnaissance flights. The operations section gets the current friendly ground force situations from the ARFOR G3 and interprets that situation for the JAOC combat operations division. The operations section coordinates ATACMS [Army tactical missile system] missions and the required airspace with the JAOC, including both ARFOR and JFACC initiated missions. The operations section coordinates ARFOR aviation and deep attack operations and airspace with the JAOC." (FM 100-13, Pages 2-2 and 2-3.)

The BCE Operations Section learned a great deal about airspace deconfliction and battle tracking in Operation Allied Force. In essence, the BCE kept both the Air Force and the Army apprised of each other's actions. Failure to do so dramatically increases not only the confusion in combat but also the likelihood of fratricide.

ATACMS Airspace. The deconfliction of ATACMS airspace is crucial for air operations. An ATACMS flight can take down a friendly aircraft. Less obvious, nearby aircraft can easily read the ATACMS' launch signature as an air defense attack. This leads to a friendly pilot taking evasive action that typically consists of jettisoning critically needed munitions and external fuel tanks and beginning dramatic evasive maneuvers. The pilot may be unable to attack his assigned targets and inadvertently could injure friendly soldiers or civilians. The occurrence of such actions due to a coordination failure is inexcusable.

The lesson learned is that all pertinent ATACMS information must be included in the ATO and airspace control order (ACO), once again balancing predictability against flexibility.

Firefinder Radars. The Q-36 and Q-37 provided a crucial coordination challenge because friendly aircraft can identify them as potential enemy targets. Aircraft such as the EA6B and the F16CJ are armed with the high-speed anti-radiation missile (HARM), a missile designed to detect emitters and suppress enemy air defenses (SEAD). Thorough coordination and knowledge of radar locations and the bandwidth on which these emitters operate stops pilots from launching on friendly radar sites.

GLTs must provide Air Force planners the information they need to reduce the likelihood of acquiring a friendly Q-37. The planners then can factor the radars into their plan—change the direction of attack or limit the flight range of the HARM.

Post-mission check by ground crew—81st Expeditionary Squadron in Operation Allied Force.

Plans Lessons

"The BCE plans section focuses on operations 24 to 96 hours out. The plans section integrates and synchronizes air operations planning with the COMARFOR's intent and scheme of maneuver. The plans section ensures the COMARFOR's guidance and priorities are used to enhance air support to the ARFOR. The plans section airspace personnel coordinate ARFOR airspace use requirements with the JAOC airspace management sections, integrate ARFOR airspace user activities with the JAOC airspace plans, integrate joint airspace requirements with appropriate A^2C^2 [Army airspace coordination cell] elements, and represent the COMARFOR's interests in the development and approval of airspace control restrictions published in the ACO." (FM 100-13, Pages 2-5 and 2-6.)

TF Hawk was responsible for developing potential engagement areas within Kosovo for deep attack missions by Apaches and ATACMS, yet the CFACC controlled all airspace within the area of responsibility (AOR). These two facts necessitated coordination between TF Hawk and the CAOC to avoid a blue-on-blue engagement and provide TF Hawk all the support needed to conduct combat missions.

ATO Flexibility. The initial challenge was placing Army aviation assets on the ATO within the CAOC's 72-hour ATO cycle. Typically, Army aviation deep attacks require maximum flexibility to attack their target sets, which runs counter to the standard 72-hour ATO cycle input: routes or axis and the number and type of aircraft.

TF Hawk resolved this challenge by identifying a projected F-Hour—cross-forward line of own troops (FLOT)—time for its mission 72 hours in advance, allowing Air Force planners to move their Kosovo engagement zone support packages to provide coverage for the TF Hawk mission. The support packages included tankers, an airborne command and control center (ABCCC), air-to-air fighter support, lethal and non-lethal SEAD, etc. This arrangement allowed both TF Hawk and CAOC to maintain flexibility while operating predictably enough to synchronize assets.

Whenever TF Hawk moved its F-Hour outside of the Kosovo engagement zone window, the CAOC had significant problems. Changes to F-Hour occurred less than 24 hours from execution on several occasions, making Air Force support of TF Hawk's mission readiness exercises (MREs) extremely difficult. In essence, a change to an MRE was frequently felt at every level—fuel tankers, ammunition handlers, SEAD sorties, crew rest, etc. In every case, the MREs occurred in Albania at the same time the CAOC was conducting combat missions over Kosovo and Serbia. On some occasions, the Air Force had to cancel combat sorties to support training exercises.

Dual ATOs. While deep attack missions went on the "US Only ATO" for operational security reasons, all TF Hawk aircraft had to be reflected on the NATO ATO to prevent fratricide. Initially, putting TF Hawk aircraft on two separate ATOs and coordinating with two separate ATO production teams created problems. These were resolved by placing all TF Hawk aircraft on ground alert status every day on the NATO ATO, which kept the allies informed of all TF Hawk "squawk" codes and prevented allied aircraft from incorrectly identifying TF Hawk aircraft as hostile.

To ensure complete understanding of procedures for ATO inclusion and airspace management, BCE personnel and planners at the CAOC developed standing operating procedures (SOP) for TF Hawk mission execution. This SOP was staffed at TF Hawk and the CAOC and adopted.

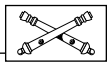
Conclusion. The most striking and erroneous observation of Operation Allied Force is the role of air power as a single decisive arm in warfare. Proponents of air power are, understandably, very proud of the performance of US and NATO Air Forces during this operation. Some have indicated that, based on this operation, new doctrine may emerge that will reshape joint warfighting.

We must be cautious about extrapolating too much from the success of the exclusive use of air power in Kosovo. The United States and NATO had no vital interests at stake in Kosovo. Therefore, there was little willingness to expend the political capital required to employ ground forces or to accept the toll in blood and treasure that would certainly result from a ground campaign. It is premature to rewrite doctrine (read restructure the defense budget) based on this experience.

Our enemies will threaten our vital national interests in the future in a scenario that will offer a dramatically different calculus to our leaders. Internalizing the notion that air power alone can defeat a competent ground force is too broad a conclusion to draw from one operation.

USAREUR and USAFE must train together at the operational and tactical levels of war more often. We must explore innovative ways of integrating exercises such as the Army's Warfighter or the Air Force's Union Flash. At the tactical level, Air Force assets must train with Army maneuver and fire units to achieve synchronization and efficiency on the battlefield.

The "ramp-up" cost of gaining mutual understanding during Operation Allied Force was too high. A more lethal and capable enemy won't allow NATO forces the time to ramp up. And then we'll pay the price in blood and treasure.



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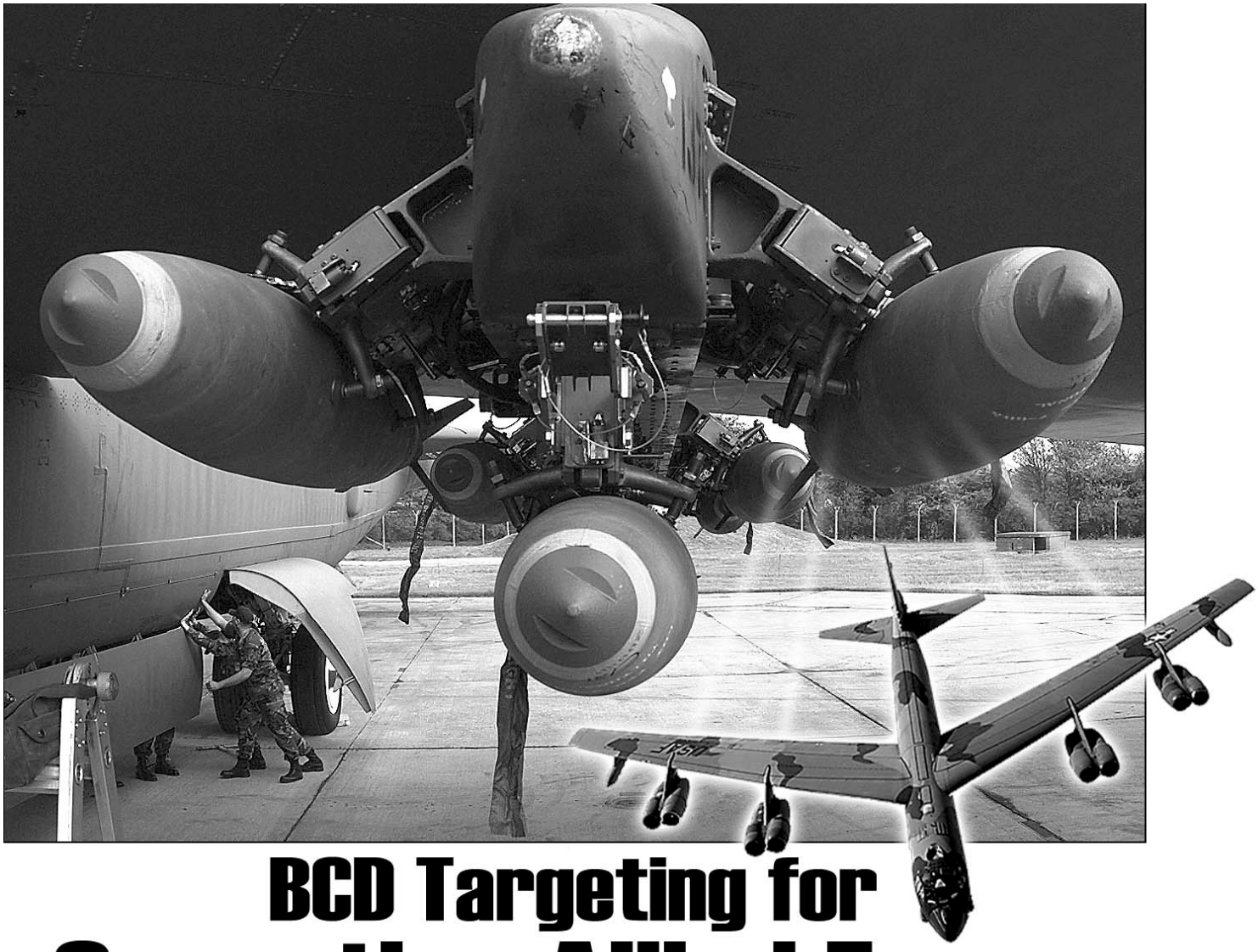
The authors wish to acknowledge the contributions to the article of the following: Lieutenant Colonel Brian S. Lacey, Infantry, Deputy Commander of the BCE; Major Rodrigo E. Mateo, Air Defense Artillery, BCE; Major Darrell T. Wilson, Infantry, GLO, 31st Fighter Wing and Captain Gregory Z. Thompson, Aviation, Operations Officer for the BCE.



US B-52s, RAF Fairford, England, in Operation Allied Force (Photo by Air Force SSG Randy Mallard)

BCD Targeting for Operation Allied Force

by Lieutenant Colonel Robert S. Bridgford and Major Luke G. Grossman, USAF

Contrary to many accounts, Operation Allied Force in Kosovo was not an air campaign conducted solely by airmen and naval aviators. In actuality, Army personnel played a key role before and during the course of the campaign.

This article explains the targeting role the US Army Europe (USAREUR) Battle Coordination Element (BCE) played in the air campaign and, more importantly, emphasizes the part Army targeteers must play in future air campaigns against ground forces. (The BCE is an echelons-above-corps organization that recently was renamed battlefield coordination detachment, or BCD).

Army intelligence personnel are the experts in the intelligence preparation of the battlefield (IPB); their expertise, experience and analytical capabilities are critical to any effective joint targeting effort against enemy ground forces. The Operation Allied Force's Combined Air Operations Center (CAOC) at Dal Molin Air Base, Italy, received limited tactical-level Army intelligence support before and during its air campaign, creating a significant void in the joint targeting process, specifically targeting enemy ground forces. The BCE stepped in to fill that void to varying degrees from the initiation of the crisis in May 1998 through the end of the air campaign in June 1999.

The BCE provided targeting support in three phases. During Phase I, May 1998 through March 1999, it targeted fixed sites in support of the force buildup and the initial target sets for the first few days of the air campaign. The second phase of targeting began in late March 1999 when the Supreme Allied Commander Europe (SACEUR) directed the CAOC begin attacking Serbian mobile ground forces in Kosovo. The BCE continued to develop and recommend fixed targets and then develop, track and nominate mobile targets.

Phase III of targeting began 25 May 1999 when Task Force (TF) Hawk in

Albania submitted its first target nominations. TF Hawk was a V Corps force that consisted of Army attack helicopters, a multiple-launch rocket system (MLRS) battalion (1st Battalion, 27th Field Artillery, or 1-27 FA) and maneuver protection forces. This last phase fit within the BCE's doctrinal role of representing and advocating the Army force commander's (COMARFOR's) air support requests during the Air Force's air tasking order (ATO) and execution processes. Throughout Phase III, the BCE continued to develop and nominate fixed and mobile targets.

Targeting Serbian Ground Forces. In Phase II, the SACEUR directed the combined force air component commander (CFACC) focus on destroying Serbian ground forces in Kosovo. In response to the initial NATO bombing, the Serbian forces intensified their counterinsurgency operations against the Kosovar Liberation Army (KLA) and non-Serbian Kosovar civilians, thus creating more casualties and an ever-increasing flow of refugees. The intense media coverage of the unfolding tragedy resulted in the political need to "do something."

This political pressure created two problems for the CAOC. First, it had to conduct what was basically a "movement-to-contact" from 15,000 feet above the ground using air-to-ground aircraft without the intelligence support it needed to target the small tactical counterinsurgent elements.

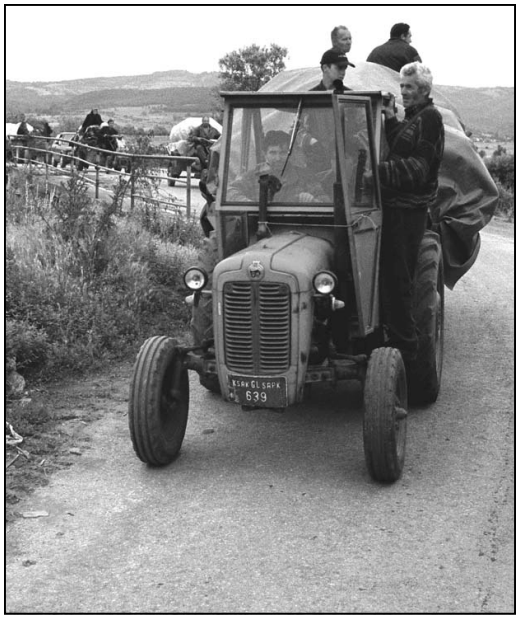
Second, the refugee flow was a significant obstacle to attacking ground forces because of the fear of striking innocent civilians and internally displaced persons. The CAOC had to track the movement of displaced persons and ensure they were a safe distance away before attacking the targets. The CAOC focused on carefully destroying ground forces without Army intelligence support to develop the IPB products it needed.

Ordinarily, the land component commander (LCC) would direct the ground campaign, requesting air support to augment his plan. The lack of a ground force and a designated LCC created a void in Army intelligence at the tactical level and a void in expertise to direct the attack against the Serbian ground forces. This is not to say that the CFACC needs Army help in controlling his aircraft—he doesn't. However, when there's no designated LCC or ARFOR and air forces must attack ground forces, Army maneuver expertise is needed to determine the strategy for defeating enemy ground forces. This strategy includes determining the priority and focus for collecting against, tracking, targeting and attacking enemy ground forces.

Trolling for Targets. In April 1999, the targeting process changed continuously in an attempt to compensate for the missing intelligence and command structure. Techniques for attacking ground forces included "trolling" for targets. Aircraft flew over Kosovo looking for enemy forces in the open. This was not very successful; the Serbs were smart and limited their operations to times when aircraft were not flying.

The Serbs also limited their exposure in the way they conducted counterinsurgency operations. They positioned armored vehicles on key routes in and out of a town and then used artillery to destroy many of the buildings in the town. After destroying any organized resistance and subjecting the residents to artillery fire, the Serbs then sent in dismounted troops to conduct more personalized destruction and killing. If they didn't kill all the residents, the Serbs created a refugee flow in the direction they desired.

These small Serbian platoon- or company-sized elements were the focus of the air campaign by April 1999. The Serbs did not present large formations of vehicles or troops in the open because they didn't need large concentrations of forces for their operations. Thus, the Serbs were able to disperse their forces. These Serbian techniques complicated the CAOC's new mission of finding and attacking enemy ground forces.



In response to the initial NATO bombing, the Serbian forces intensified their counterinsurgency operations against the Kosovar Liberation Army (KLA) and non-Serbian Kosovar civilians, thus creating more casualties and an ever-increasing flow of refugees.

In early April, the BCE began to increase its involvement in the targeting process at the CAOC in an attempt to fill the intelligence, targeting and strategy void. At that point, TF Hawk was issued a deployment order to move to Albania. By 9 April, the entire BCE, including augmentees, joined BCE elements already collocated with the 32d Air Operational Group (AOG) out of Ramstein AFB in Germany at the CAOC in Italy. The BCE prepared to conduct the doctrinal role of supporting an ARFOR (TF Hawk) in Phase II. Although TF Hawk was the *de-facto* ARFOR, it never was designated the LCC nor was the CFACC designated the "supported commander." In fact, TF Hawk never received employment authorization from the National Command Authority (NCA).

Fixed and Mobile Targets. Up to this point, a distinction had been made between fixed targeting and mobile or fielded forces targeting. The reason for the distinction is that the targeting process was divided into these two components at the CAOC. The fixed and mobile targeting processes were separate because of the nature of the targets, the different planning cycles required and the separate approval processes.

Fixed targeting called for traditional strategic attack (SA) and air interdiction (AI) missions against fixed facilities and infrastructure targets. The CAOC's intelligence structure and staff were well-suited to perform this doctrinal function. Their training and knowledge enabled them to perform superbly, given the political constraints of the rules of engagement (ROE) and targeting restrictions.

Fixed targeting went through a rigorous target approval process based on a collateral damage assessment, the location and type of the target and any political considerations. Given these considerations, target approval authority ranged from the CFACC to the NCA and the North Atlantic Council.

Mobile targets were Serbian ground forces, including temporary command posts, assault bridges and other mobile assets. It might be easier to

think of the mobile or fielded forces as forces that normally would be engaged by friendly ground forces, either through direct action or through close air support (CAS) or AI nominations to support ground maneuver.

The short dwell time of these mobile targets required a different approval process. Mobile or fielded forces went through a different series of checks and ROE considerations before they could be attacked. The critical factor was ensuring a target was neither a convoy of displaced persons nor a KLA force fighting against the Serbs. From 15,000 feet, it's very difficult to identify a target, let alone determine if it's an Army transport vehicle or a truck loaded with civilians or if it's Serbian artillery or KLA artillery. During the war, KLA forces captured Serbian artillery pieces and used them against the Serbs.

During Phase II of targeting support, the BCE's Plans and Intelligence Sections continued their efforts to develop, track and nominate fixed targets. As the air campaign progressed, the BCE's Plans Section became the proponent for fixed targets in southern Serbia and all of Kosovo from mid-April until the end of the air campaign. Both the BCE Plans Section and the CAOC targeteers recognized the unique expertise Army targeteers brought to the selection and prioritization of these target sets.

The BCE Plans and Intelligence Sections were composed of Army intelligence and artillery officers and NCOs and were, in essence, the missing targeting team. They focused on cutting lines of communications (LOCs) and isolating Serb forces by dropping bridges and striking barracks, command posts and any other fixed targets that degraded the Serbian Army's ability to conduct counterinsurgency operations. This fixed targeting process was later tied to targeting ground forces during Kosovo engagement zone operations through the coordinated efforts of the BCE's Plans and Operations Sections.

CAOC Organization. The fixed targeting process is a standard task of any AOC and is conducted by the strategy cell, guidance, apportionment and targeting (GAT) cell, master air attack planning (MAAP) cell and ATO production cell. The BCE Plans Section was integrated with those cells in its doctrinal role of ensuring the COMARFOR's requirements are advocated throughout the ATO cycle (Figure 1).

In targeting ground forces, requirements normally come from the CAS and AI nominations submitted by the ARFOR to support the ground campaign. This component was missing, so the only section in the structure available to fill the void was the CAOC's Flex Targeting Cell, which was responsible for mobile targets.

The flex targeting cell initially was comprised of two Air Force officers who focused on emerging integrated air defense threats; it grew to four Army intelligence personnel shifts who comprised the CAOC's Ground Analysis Cell. The current operations nature of this small section made it the obvious choice to assume the role of identifying emerging ground targets. This is the role of an Army analysis and control element (ACE).

Flex Targeting Cell. The CAOC Intelligence Director (C2) understood the need for Army intelligence personnel to help target ground forces and pushed

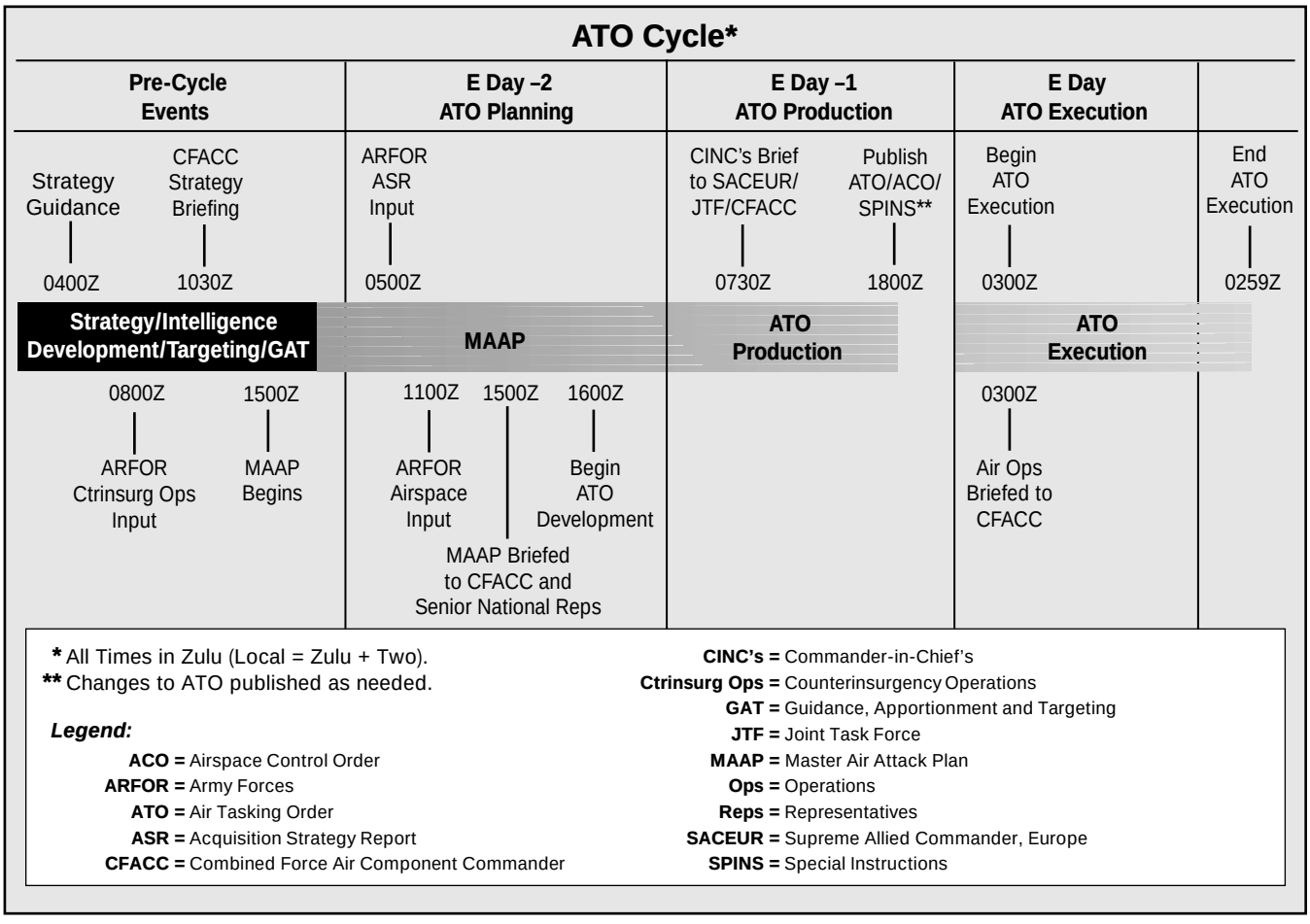


Figure 1: ATO Cycle During Operation Allied Force

for Army augmentees to fill out his targeting cell. He pushed for the BCE to perform the ARFOR ACE function. The BCE helped the CAOC's Flex Targeting Cell, but BCE manning did not provide the personnel and expertise to replicate an ARFOR ACE. The C2's request for Army intelligence personnel was partially filled with the arrival of an Army Military Intelligence (MI) captain from Hawaii, several Military Occupational Specialty (MOS) 96B Intelligence Analyst NCOs and one warrant officer from the 66th MI Group in Germany. They formed the ground analysis cell of the flex targeting cell.

This ground cell had one or two Army intelligence personnel per shift for most of the air campaign and grew to four Army intelligence personnel per shift, including BCE assistance, by the last week of the air campaign. The cell became responsible for building and tracking the enemy ground order of battle and determining the priority and focus for collecting, tracking, targeting and attacking enemy ground forces.

Designating flex targeting cell responsibility for targeting ground forces and trickling in Army intelligence personnel did not solve the problem of finding and attacking Serbian ground forces. By mid-April, the CAOC had to change how it developed ground force targets. The result was Kosovo engagement zone operations.

Kosovo Engagement Zone Operations. These operations were designed to develop targets and the supporting imagery to help the pilots find and destroy enemy ground forces. They were based on designating prioritized Kosovo engagement zone area of interest (AOI) boxes of approximately 20-by-20 kilometers each. This focused intelligence, surveillance and reconnaissance (ISR) assets to develop targets within the boxes. The focus was on a general area 96 hours out and selected AOI boxes 72 hours out. Then the ISR collection assets focused on the three prioritized AOI boxes to develop imagery products for targets.

At the 48-hour and 24-hour points, the AOI boxes were validated or redesignated, based on success or failure in developing targets in those boxes. At the 24-hour point, a focused collection effort was put on all targets developed in the previous 48 hours. The resulting imagery was consolidated into a Kosovo engagement zone target list for each AOI; the list was forwarded to the air-

Serbian detainees are escorted to the Kosovo-Serbian border by Marines from the 26th Marine Expeditionary Unit. *(Photo by SGT Craig J. Shell, 2d Marine Division)*

borne forward air controllers (AFACs) before their missions. This technique allowed the AFACs and pilots to pull imagery to help them find and engage targets in their Kosovo engagement zone AOI boxes.

If the CAOC's Ground Analysis Cell or BCE identified any emerging targets, they were passed to the AFACs via the Kosovo engagement zone operations cell on the CAOC combat operations floor. Additionally, any new targets identified by the AFACs, other pilots or unmanned aerial vehicle (UAVs) were added to the AOI target list.

The Kosovo engagement zone strategy was developed during a daily targeting meeting by an ad-hoc joint targeting team led by the CAOC's Kosovo Engagement Zone Operations Cell Chief and was comprised of the C2's Ground Analysis Cell, the BCE's Operations Section and a National Collection Management Cell (NCMC) representative. Later, members of the CAOC's MAAP Cell (fixed targets) joined the daily targeting meetings to ensure fixed targeting supported Kosovo engagement zone operations.

This ad-hoc strategy and targeting team tried to compensate for the lack of Army intelligence and targeting input from the LCC or ARFOR but, understandably, lacked the knowledge, experience, expertise and analytical capability of an ARFOR staff and ACE. The team's decisions were based on macro-level intelligence summaries (INTSUMs), not tactical-level IPB products. The only Army intelligence personnel focused on the ground situation at the tactical-level and providing those products to the CAOC were the C2's Ground Analysis Cell and the BCE's Intelligence Section. Those sections had a full-time task of tracking the enemy ground situation, monitoring displaced person's movements and ensuring that nominated targets met the ever-changing ROE—aside from their developing, tracking and nominating ground targets. The BCE Plans and Operations Sections had daily internal meetings to determine targeting priorities for fixed targeting to support Kosovo engagement zone operations.

TF Hawk Joins the Targeting Effort. The third and final phase of BCE support to the CAOC targeting began with TF Hawk's submitting target nominations on 25 May. TF Hawk's participation in the process continued until the end of the war, 9 June.

In the last two weeks of the air campaign, TF Hawk passed approximately 600 targets to the BCE as ad-hoc targets for Kosovo engagement zone operations, which the BCE pushed into the flex targeting process (Figure 2 on Page 18). The BCE screened the target nominations to ensure they were in Kosovo and did not violate the ROE or any no-fire areas (NFAs) or other fire support coordinating measures (FSCMs). The BCE tracked all targets and pushed them through the CAOC Ground Analysis Cell.

The CAOC Ground Analysis Cell verified the BCE's conclusions that the target nominations did not violate any ROE and checked the targets against known locations of displaced persons and KLA forces. If the targets met the

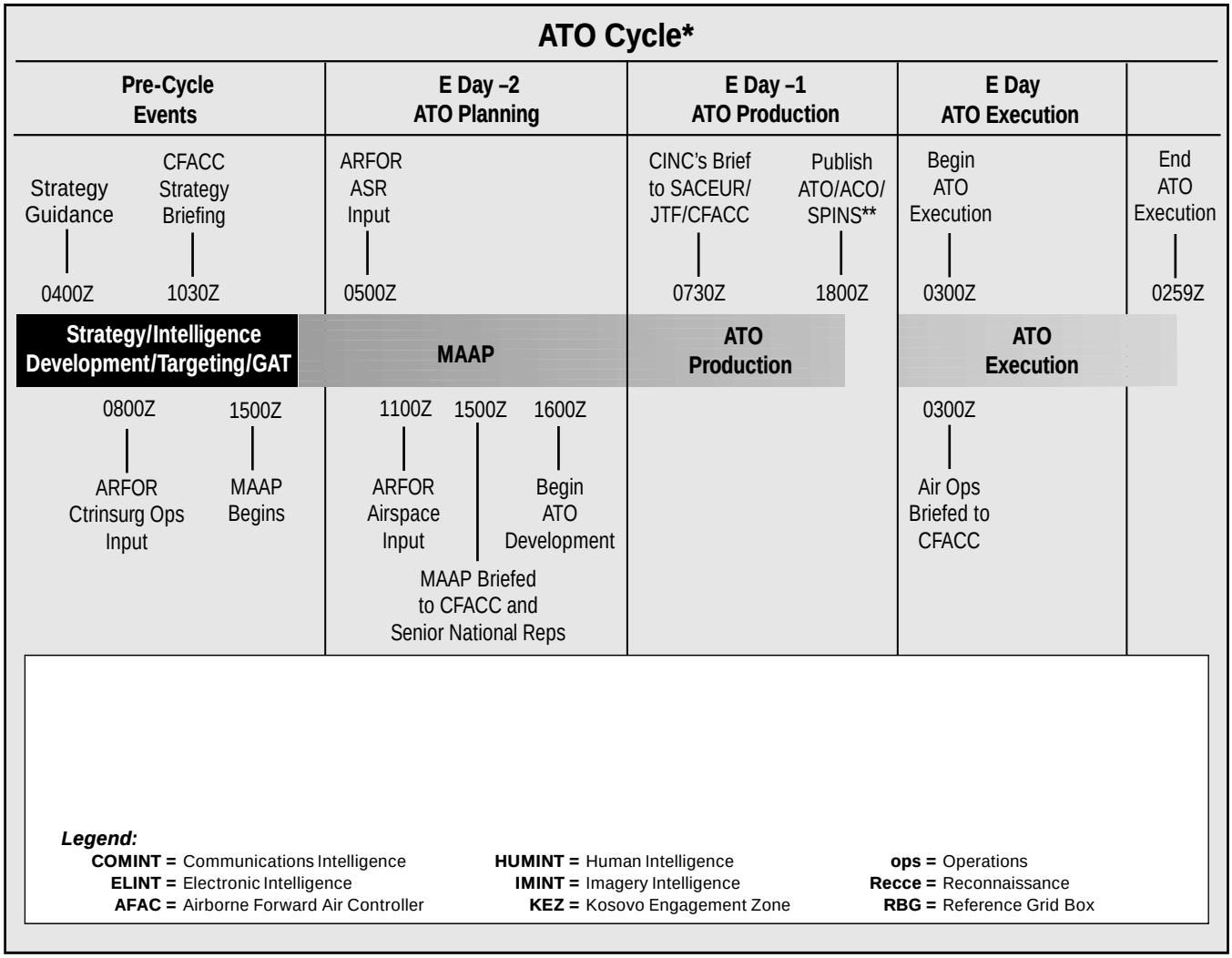


Figure 2: Flexible Targeting Process

required criteria, the nominations were taken to the C3 for approval and then to the Kosovo engagement zone operations representative in the CAOC. The representative radioed the targets to the airborne command and control center (ABCCC) that, in turn, passed the targets to an AFAC for action.

When the AFAC received the target, he or another pilot would check the target location and engage it *if* he concurred the target was positively identified as enemy. The Air Force never shied away from striking valid targets; on the contrary, they were extremely anxious to strike all targets that met the ROE.

The targeting process took five to 10 minutes from the receipt at the BCE Operations Section until the target specifics passed to the ABCCC.

There are two key points to take away from the 600 targets submitted by TF Hawk during the last two weeks of the war. First, this large number displayed the capability of an ARFOR using its intelligence and targeting resources to push targets to an AOC.

Second, the main reason a large number of targets were identified during the last two weeks of the war was because the Serbs then had to fight a capable enemy ground force, the KLA, for the first time during the war. The KLA's success in late May forced the Serbs to counterattack and array some of their forces in the open, making them much more vulnerable to attack from the air than at any other time during the air campaign.

All TF Hawk target nominations were submitted via automated deep operations coordination system (ADOCS) software as fire missions. ADOCS was the command, control, communications, computer and intelligence (C^4I) system TF Hawk was most familiar with. The BCE was loaned several ADOCS laptops and rapidly became proficient at using the software for receiving target nominations and coordinating airspace requests in support of TF Hawk mission rehearsal exercises (MREs). TF Hawk conducted MREs in preparation for the use of Apache helicopters in deep attacks into Kosovo. The CAOC supported the MREs while continuing to conduct combat operations.

B-1 and B-52 Strikes—"Heavy Drops." The last area of targeting was the "heavy drops" planned for B-1 and B-52 bombers. Throughout the air campaign, the BCE, in conjunction with the CAOC Ground Analysis Cell, developed assembly area (AA) targets for the B-52 and B-1 bombers. These targets were suspected Serb Army AAs or locations where they had collected forces. AA targets also had to be completely free of any possible collateral damage to facilities and away from any known displaced persons or KLA location. B-1 or B-52 bombers then tried to destroy all forces or equipment in the AA (approximately one square kilometer).

A B-52H Stratofortress sits on the ramp as a B-1B Lancer from the 77th Bomb Squadron, lands at RAF Fairford in support of NATO Operation Allied Force. *(Photo by Air Force SSG Efrain Gonzalez)*

During the last two weeks of the air campaign, TF Hawk passed heavy-drop target nominations to the BCE. The targets then were refined for the B-1 and B-52 planners to send a mission to their crews. The BCE Operations Section and CAOC Ground Analysis Cell analyzed each target to determine the disposition of the enemy forces on the ground and the best attack means. The targets were received on ADOCS and then displayed using its 1:50,000 digital maps. Aim points were determined to provide the best weapons' effects on those forces (i.e., dropping the bombs going uphill versus downhill so the effects and force of the blast went into a bunker or foxhole instead of skipping over it). The BCE Operations Section and CAOC's Ground Analysis Cell personnel then worked closely with the B-1 and B-52 planners to refine the aim points, direction of attack, the stick length (the length and width of the bomb impact and effects) and the sequence of the strikes.

After the joint targeting team of the BCE Operations Section, CAOC's Ground Analysis Cell and the B-1/B-52 planners agreed, a one-meter resolution image was created with the desired aim points, coordinates and other critical information displayed. This image then was sent to the aircrew either before or after they had taken off, along with any other pertinent targeting information.

Several techniques were used to enhance the effects of the heavy drops. One technique was to drop ground-burst munitions on a target and then delay for several minutes before dropping air-burst munitions in the hopes of catching the enemy moving out after the initial strike. Another technique was to follow a heavy drop with air-to-ground aircraft, such as A-10 Warthogs, to engage any remaining enemy forces that might have survived the initial drop. These and other techniques were developed based on watching UAV videos of heavy drops and the enemy survivors' reactions to the drops.

The effects of those heavy strikes during the last two weeks of the air campaign are still being debated and researched, but the initial reports received from the field claimed they were very effective in destroying Serbian ground forces, particularly in the Mount Pastrik region. Some of the heavy drops were close enough to KLA forces to have been considered CAS missions while most were probably more traditional AI missions. The B-1 and B-52 bombers were extremely effective and could have been even more effective supporting an Army ground force requesting CAS and AI support. Their accuracy and flexibility was tested many times during the air campaign.

In reading this article it is easy to misinterpret this information and assume the BCE had the personnel and capability to fill the intelligence and targeting void that existed, but that was not the case. The BCE did its best to fill that void, but the lesson to take away is that neither the BCE nor the CAOC's Ground Analysis Cell had the manning, experience or expertise to replicate—let alone replace—the ARFOR commander, his staff and his ACE.

Throughout Phases II and III of targeting support, the BCE also was very busy providing the doctrinal support to TF Hawk MREs. The BCE would have been even busier had TF Hawk been given the order to execute attacks.

If another conflict arises where air power alone is used against an enemy ground force and no LCC/ARFOR is designated or fielded, there must be augmentation to the combined/joint air operations center (C/JAOC) to perform the Army intelligence and targeting functions against those enemy ground forces.

The IPB is a core competency of the Army. Our doctrine and theater directives must reflect that requirement.

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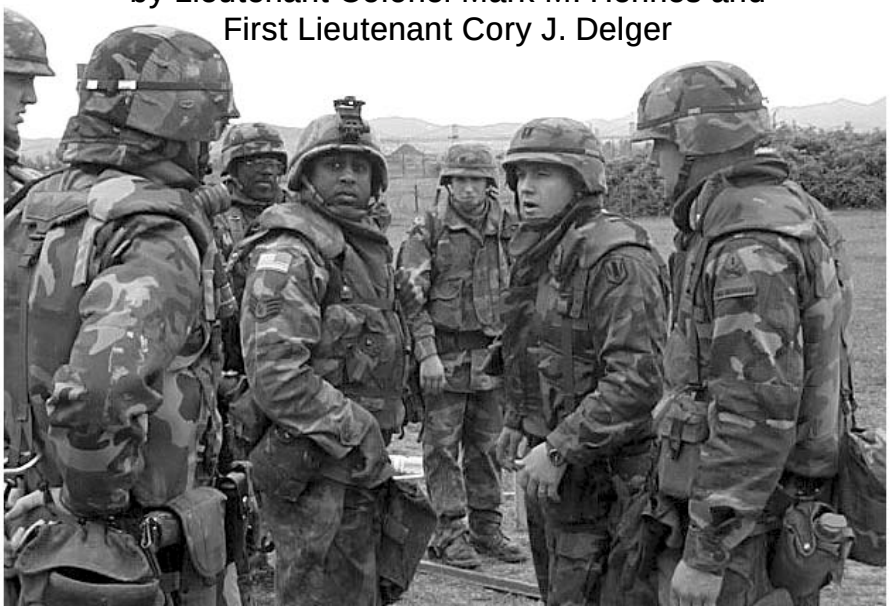
Major Luke G. Grossman, Air Force, is Deputy Chief C3 of the Current Operations Division in the Combined Air Operations Center (CAOC), Vicenza, Italy. He was the Offensive Air Operations Branch Chief in the C3 Current Operations Division during Operation Allied Force as well as C3 Kosovo Engagement Zone Operations Cell Chief. Major Grossman is an F-16 pilot with operational experience in Europe and Korea. Before his assignment to Vicenza, he was Chief of Wing Standardization and Evaluation for the 52d Fighter Wing, Spangdahlem Air Base, Germany. He is a graduate of the US Air Force Squadron Officers School, Maxwell Air Force Base in Alabama, and holds a Master of Military Science in Land Warfare from American Military University, Manassa Park, Virginia. Major Grossman is slated to attend the Command and General Staff College, Class of 2000, at Fort Leavenworth, Kansas.

FA Battalion C^2 in Albania and Kosovo

by Lieutenant Colonel Mark M. Hennes and
First Lieutenant Cory J. Delger



In April 1999, the 1st Battalion, 27th Field Artillery (Multiple-Launch Rocket System, MLRS) *Gridsmasher* (1-27 FA), V Corps, deployed to Tirana, Albania, in support of Task Force (TF) Hawk. During the next three months, our battalion faced a series of command and control (C^2) challenges as part of TF Hawk in Albania and then TF Falcon in Kosovo, but our battalion proved flexible enough to meet them.

Task Force Hawk—Albania. First, the battalion had a nonstandard tactical mission to provide MLRS fires in support of the AH-64 Apache helicopters of V Corps' 11th Aviation Regiment. Our mission closely resembled direct support (DS), but we did not furnish fire support personnel. Additionally, our fires were planned by the V Corps Deep Operations Coordination Cell (DOCC), which coordinated with the attack helicopter battalion and then sent the fire plans to the 1-27 FA fire direction center (FDC). Initially, we had no brigade element to serve as a conduit between the DOCC and the battalion as in standard operations.

Delivery of Missile Fires. The battalion faced a number of technical challenges related to fire mission processing. In the weeks preceding the deployment, we upgraded our launcher software to Version 7.2 and fire direction system (FDS) weapons descriptive files to shoot extended-range rockets. This added a third munition to the battalion's capabilities but posed no training challenges.

What did pose some challenges was the Army tactical missile system (ATACMS). In corps Warfighters and home station command post exercises (CPXs), the battalion became quite proficient at executing fire plans with no more than six ATACMS targets. However, the number of ATACMS shot in a single suppression of enemy air defense (SEAD) plan during mission rehearsal exercises (MREs) in Albania expanded dramatically to 81 targets. This required us to increase the number of launchers shooting in the fire plan, sometimes up to 15 launchers on a firing point, and to deconflict by space and time.

Deconflicting by space at first appeared easy. We had developed new MLRS tactics, techniques and procedures (TTP) that more closely resembled cannon than MLRS TTP and thought we had struck a balance between force protection and tactical dispersion. (See the sidebar to this article "Cannon Battery TTP for MLRS in Albania.")

The compact firing points, however, posed a problem because of the ATACMS missile's random offset when firing. This offset causes the missile to travel up to 32 mils off the launcher-target line for the first few seconds of flight to protect the launcher from counterbattery fire. This offset presented a risk of collision because of the close proximity of the launchers and the unpredictable size and direction of the offset.

Deconflicting by time was also a challenge. When firing in support of Apache strikes, the DOCC wanted the missiles shot as late as possible to limit the enemy's recovery time. On the other hand, the DOCC wanted all firing completed not later than 20 minutes before the helicopters crossed the forward line of own troops (FLOT). Balancing these two requirements caused us to try to fire as many missiles as possible in as short a time as possible.

Complicating this compressed fire plan is the fact the FDS only can send time-to-fires (TTFs) or time-on-targets (TOTs) in minute increments and the fire-to-ignition time is unpredictable (up to 15 seconds for Block I and up to 90 seconds for Block IA).

At first we attempted to solve these problems using an "At My Command" method of control, but the increased radio traffic and FDC's complex control of primary and backup launchers made the method unmanageable. We eventually settled on firing no more than two missiles at one time with no less than one minute between pairs of missiles. We also paired flank launchers to fire whenever possible.

Throughout the remainder of the operation, the battalion continued to develop its TTP for delivery of missile fires. Target groups were pushed closer to the F-Hour until the final targets were shot at F-10 minutes. Standard fire plans were broken into several groups, requiring the batteries to conduct deliberate, rehearsed reload operations between target groups. The fire direction of the ATACMS fire plan was constantly perfected, but it was a mission the battalion was familiar with in training. During the deployment, though, other battalion missions required drastic changes in standing operations and fire direction procedures.

To extend the task force's deep strike capability, the task force attached four improved position determining system (IPDS) launchers from 2-18 FA to 1-27

FA. These launchers added a fourth munition to the *Gridsmasher* arsenal, the Block IA missile that can reach out beyond 300 kilometers.

We established a rotation cycle for our fire support mission. About every four days, a battery would roll out of the base camp to the firing points. The battery that completed its four-day rotation returned to the base camp for recovery operations, and the third battery began its troop-leading procedures and mission preparation. The four IPDS launchers had a more robust rotation. Every time one of 1-27 FA's firing batteries deployed to its firing points, two IPDS launchers were attached to it to maintain the deep strike capability.

Communications. The battalion had trouble communicating with the firing batteries at the firing points. There was significant radio frequency interference resulting from the terrain in the Albanian lowlands and from numerous, unshielded, high-tension power lines in our operating area, making frequency hopping impossible. Even with single-channel communications, we had to establish a retransmission site to communicate 15 kilometers.

Unfortunately, the battalion's modified table of organization and equipment (MTOE) does not provide retrans assets for the three critical nets: battalion fire direction voice and digital and the battalion command net. To communicate via radio, we "borrowed" a retrans team from the 41st FA Brigade and created a third vehicle out of organic assets. Then to maintain a redundant means of communications with the firing points at all times, we were issued tactical satellite (TACSAT) communications equipment (MST-20 and, later, Spitfire).

Forward Operating Base (FOB). To provide a counterfire detection and rocket firing capability into Kosovo, we established a FOB in the northeastern mountains of Albania, creating the FA Task Force. (See Figure 1.) Two of our IPDS launchers were attached to the MLRS battery at the FOB to provide an even greater deep strike capability.

The battalion FDC and staff had to conduct split operations to command and control ATACMS fires from the Tirana area and rocket or missile fires from the FOB. The battalion FDO and one Military Occupational Specialty (MOS) 13P30 MLRS Specialist came from the battalion FDC with a 13P20 and 13P10 from the firing batteries, constituting the forward battalion FDC. The tactical operations center (TOC) at the FOB consisted of the battalion commander, the assistant S3, S2 NCO, two operations sergeants, and one S1and S4 NCO. This forward TOC was spread thin, relying on the TOC in Tirana for much of its service support and intelligence operations.

Initially, the presence of a maneuver brigade tactical command post (TAC), a maneuver battalion TAC and the MLRS battalion TOC created a confusing C^2 relationship for the units at the FOB. Later, the 1-27 FA commander was designated commander of Task Force 1-27 with clear authority over attached units in the FOB.

With the IPDS launchers, Task Force 1-27 could range deep into Serbian territory with Block IA ATACMS. Depending on the fire plan, the launchers could fire a mix of extended-range and M26 rockets from positions near the Kosovo-Albanian border, keeping Block I and IA ATACMS at the FOB for the long-range capability.

The Paladin platoon from 4-27 FA at the FOB also could move to positions near the border to shoot dual-purpose improved conventional munitions (DPICM). The fire plans called for the platoon to shoot 30 rounds per target, no more than two targets per fire plan.

The straight-line distance between Tirana and the FOB was more than 60 miles, far outside the maximum range of the single-channel ground and airborne radio system (SINCGARS). For communications, the FOB FDC relied on three TACSAT nets: V Corps Artillery Fire Support, TF Deep Strike and TF Force Protection (see Figure 2 on Page 22). The Spitfire TACSAT can transmit digital traffic, but because frequencies were limited, we only operated on the three voice nets.

For digital communications, the FDC used the telephone interface device (TID). The TID is basically a modem that uses mobile subscriber equipment (MSE) phones in conjunction with the lightweight computer unit (LCU) and a tactical communications interface module (TCIM) wire line adapter to send and receive digital traffic. This system requires two MSE lines for constant communications on a voice and digital net. When the Q-37 radar and its target processing section (TPS) moved forward from the FOB to provide counterfire coverage into Kosovo, they used Spitfire TACSAT for voice communications and TID for digital—a second signal extension node (SEN) team was sent to the radar site.

In the FOB FDC, two MSE phones and TIDs were dedicated to digital communications with the TPS at the radar site and with higher headquarters in Tirana. It required three TIDs to communicate with the TPS, V Corps Artillery DOCC and the rear 1-27 FA FDC

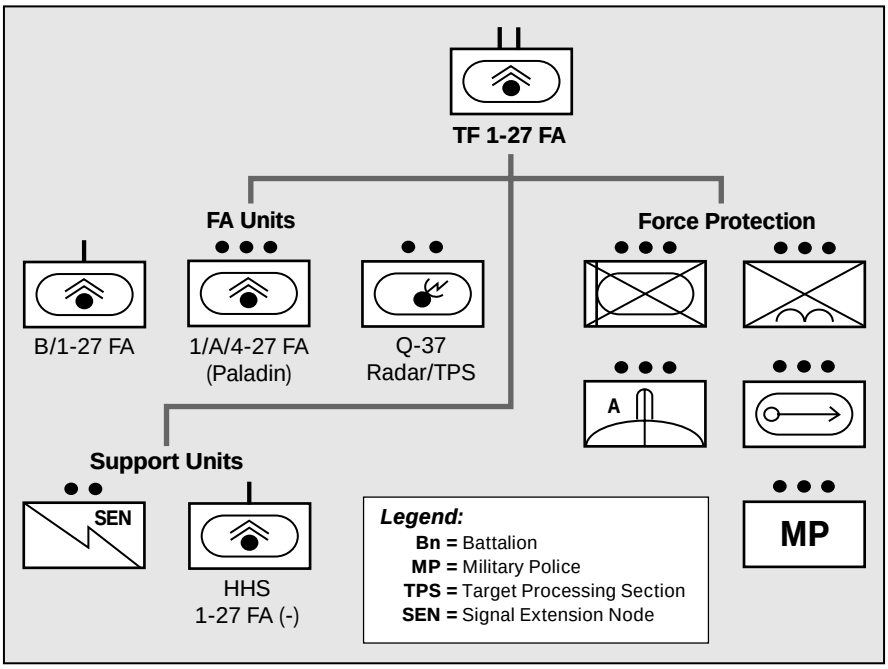


Figure 1: Organization of Task Force 1-27. Almost half the personnel assigned to the forward operating base (FOB) were force protection assets. TF 1-27 allowed TF Hawk to range out to 300 kilometers to hit targets in Kosovo with rocket and cannon fire.

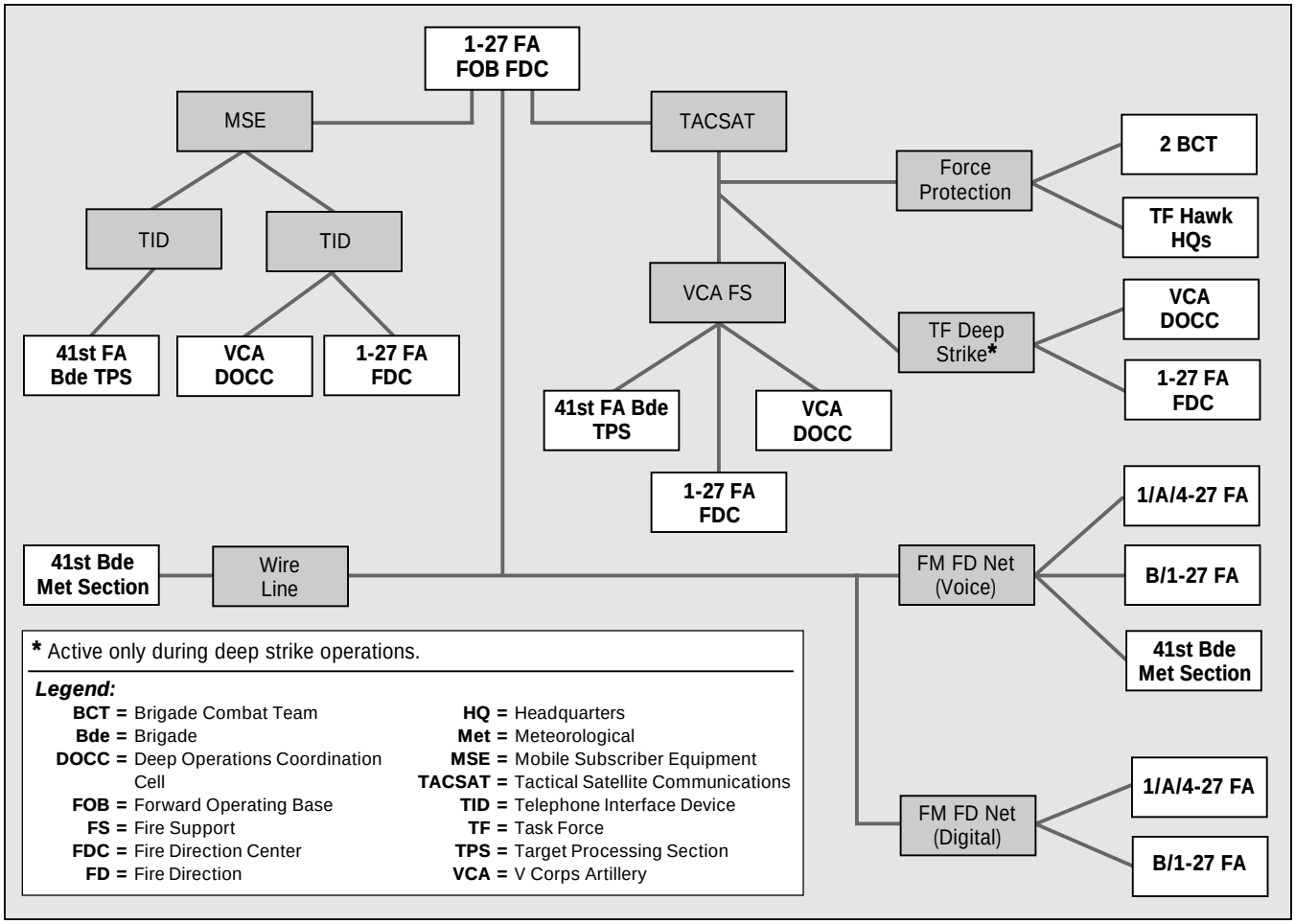


Figure 2: FA communications for TF 1-27 during operations at the FOB in Northern Albania. The battalion FDC at the FOB relied on TACSAT for voice communications with units in Tirana and the TPS and radar section located east of the FOB. Digital communications to Tirana relied on MSE and TIDs with signal extension node (SEN) support. Firing units at the FOB communicated with the FDC via FM radio.

(Tirana). But the limited number of TIDs forced the FOB FDC to keep one dedicated to the TPS to process counterfire missions and alternate the second one between the V Corps DOCC and the rear 1-27 FA FDC. The TID was used by the rear FDC for operational and logistics information and by the DOCC for fire plans.

Cannon/MLRS Simultaneous C^2. The most significant challenge for an MLRS battalion is to command and control operations involving cannon and MLRS batteries simultaneously. The FDC crewmembers (MOS 13P) found themselves doing the job of a 13C Tactical Fire Direction Specialist, controlling rocket and cannon fires and processing counterfire missions.

The most difficult obstacle was that the FDS can't communicate with the battery computer system (BCS) in cannon units, except for basic messages common to all artillery systems (MET;CM, SYS;PTM and SPRT;BGEOM). Initially, the FDC maintained only the FDS to communicate with the MLRS battery and relied on voice FM radio to send fire plans to the Paladin FDC.

Recognizing the limitations of this set-up, the FDC reconfigured the LCU to operate as an initial fire support automation system (IFSAS) that can communicate with all fire direction software. The FDC crewmembers had to learn the system, most of whom had a basic understanding but limited experience with cannon fire direction and counterfire processing. The 41st Brigade Fire Control Element (FCE) sent one 13C to the FOB to provide instruction, and A Battery, 4-27 FA, gave basic cannon fire direction lessons to our 13Ps.

IFSAS limitations became evident when the FDC began sending fire plans to the two firing units. The system works well with cannons, but for the MLRS FDS to receive missions properly from the IFSAS, 13Cs must employ various workarounds. Unwilling to send incomplete fire missions to the MLRS firing battery, the FOB FDC used an LCU with FDS to communicate with the FDC in Tirana for MLRS fire plans and another LCU running IFSAS software to communicate with the TPS and Paladin platoon FDC for cannon missions and counterfire targets. The meteorological section sent computer Met data to the FDS, which was sent to the IFSAS via wire line and then to the Paladin FDC via FM radio. The drawbacks were that two crewmembers had to man two LCUs as opposed to one, and the system was more complex than normal operations.

IFSAS normally doesn't have to communicate with MLRS units below battalion. At the battalion level, the FDC has the resources and time to manipulate the fire missions so the battery can receive complete and accurate calls-for-fire.

At the FOB, the mission was to provide counterfire. In a heavy counterfire fight, the battery would have had difficulty sending correct fire missions from the IFSAS (a job of the battalion FDC or trained 13Cs) and manage the battery

assets at the same time. The advanced FA tactical data system (AFATDS) Version 00 will eliminate the challenges of directing fires with incompatible software systems.

The benefits of the two operating systems became apparent during counterfire rehearsals with the TPS and V Corps DOCC. Unlike a counterfire fight trained in a Warfighter exercise, all counterfire targets had to be approved above the corps level due to the political nature of the conflict. Serving as a conduit between the TPS collocated with the Q-37 radar and DOCC, the battalion FDC used a TID to receive counterfire acquisitions in the form of an ATI;CDR message and forwarded them to the DOCC. To provide the most responsive fire possible, the battalion FDC sent the mission to the MLRS battery FDC as an "At My Command" mission, so the launcher was laid and ready by the time approval came from the DOCC.

Redundancy of the FOB communications plan was critical to the success of the mission. The shortcomings of the new equipment used were many. The TID relied on the operation of the SEN that was prone to power fluctuations from the unreliable generator power in Albania. Even with the SEN operating properly, the phones tended to cut out because of the satellite or tropospheric connection, severing the digital link. TACSAT communications equipment required in-depth instruction on proper operations, and the light antennas were prone to be knocked off azimuth and elevation in the field environment. Communications security (COMSEC) changes, a task not normally trained, also caused periods of communications trouble with the FOB units, none of which trained or worked together before deploying from Tirana.

Our solutions to these C^2 challenges in Albania served us well when the headquarters was tasked to deploy to Kosovo to serve as the Force FA headquarters for TF Falcon's initial entry forces.

TF Falcon—Kosovo. Headquarters, Headquarters and Service Battery (HHS), 1-27 FA, was the only battalion-level headquarters battery in theater with FDC and staff assets in place. Only HHS deployed to Kosovo; our firing batteries remained in Tirana to prepare for redeployment to the Central Region.

As the Force FA headquarters, the battalion FDC was tasked to control fires for three different cannon systems from two service branches: A/4-27 FA (M109A6); C/1-319 FA (M119); and L/3/10 FA, USMC (M198), as well D/1-33 FA, a target acquisition battery (TAB). The organization for combat had A Battery general support (GS) to TF Falcon, C Battery DS to 2-505 Infantry (IN) (Airborne), L Battery DS to the 26th Marine Expeditionary Unit (MEU) and D Battery GS to TF Falcon. As an FDC trained to provide GS fires to the corps fight, the section had to learn the fire direction procedures for the DS FDC.

The crewmembers in Tirana while the battalion operated at the FOB also had to train on IFSAS and learn the basics of cannon fire direction (especially shell/fuze combinations). This task was made easier with the addition of a 13C20 attached from the 41st FA Brigade.

As the Force FA Headquarters, the battalion FDC would direct all fires for TF Falcon. Based on the Kosovo Force (KFOR) rules of engagement (ROE), the battalion leadership developed the clearance of fire procedures for the task force. (See Figure 3.) These clearance of fires procedures were for all munitions except illumination; the approval process for illumination was delegated to the TF commander. Figure 4 on Page 24 shows the 1-27 FA FDC's voice and digital communications nets.

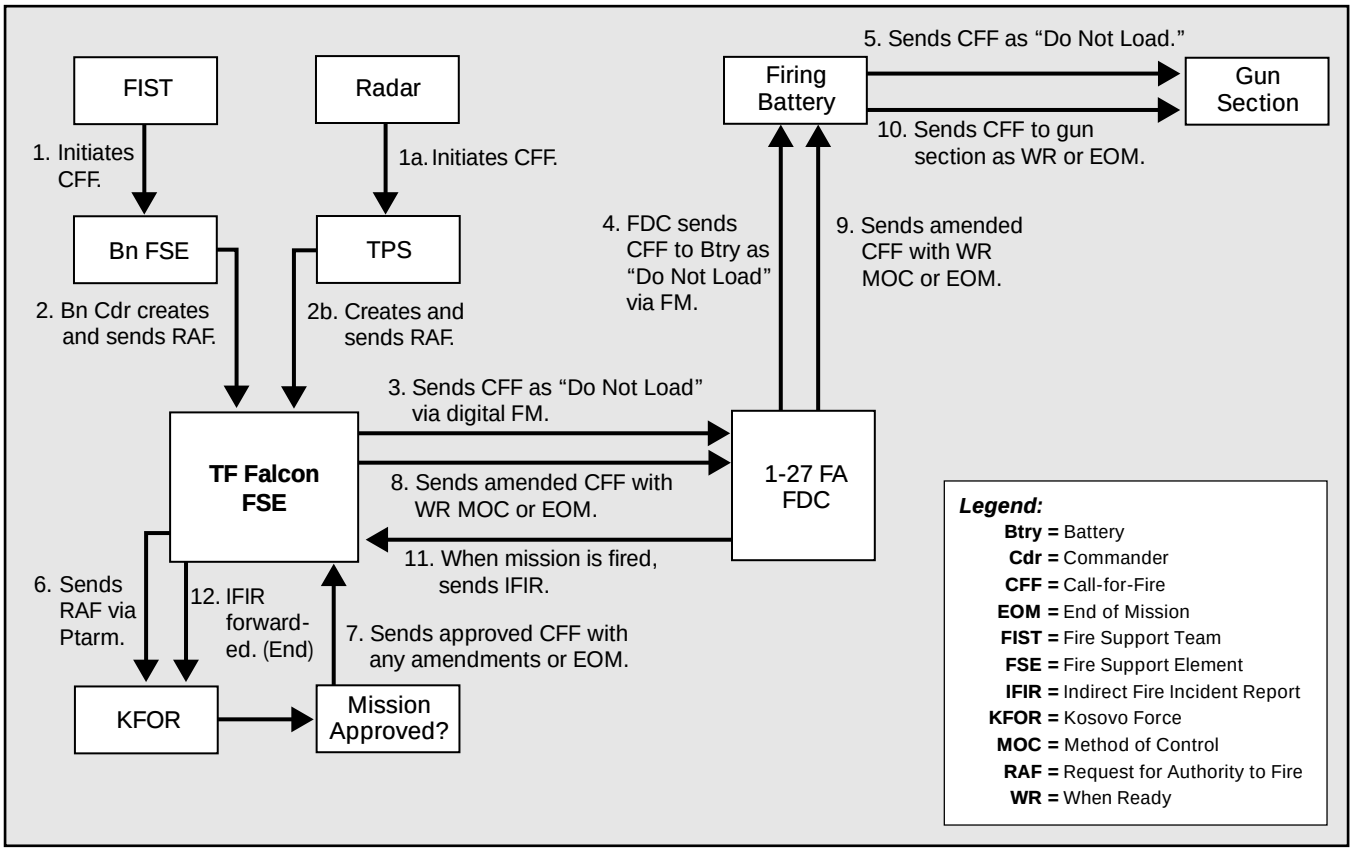


Figure 3: Clearance of Fires Procedures for Task Force Falcon

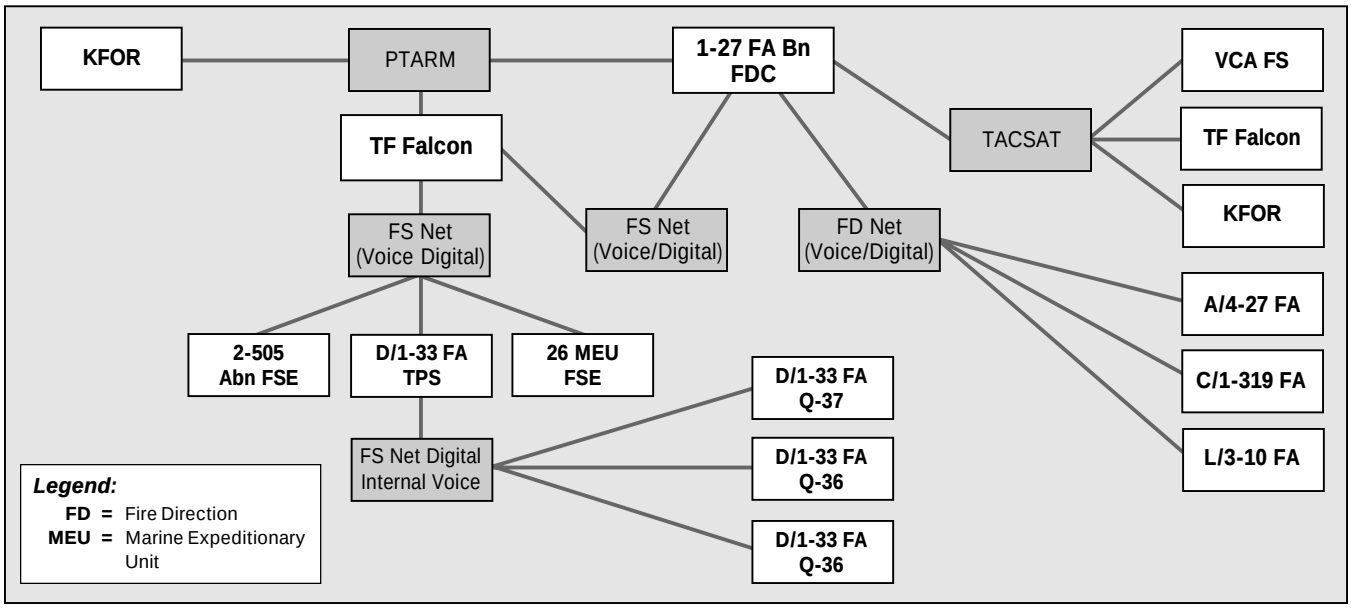
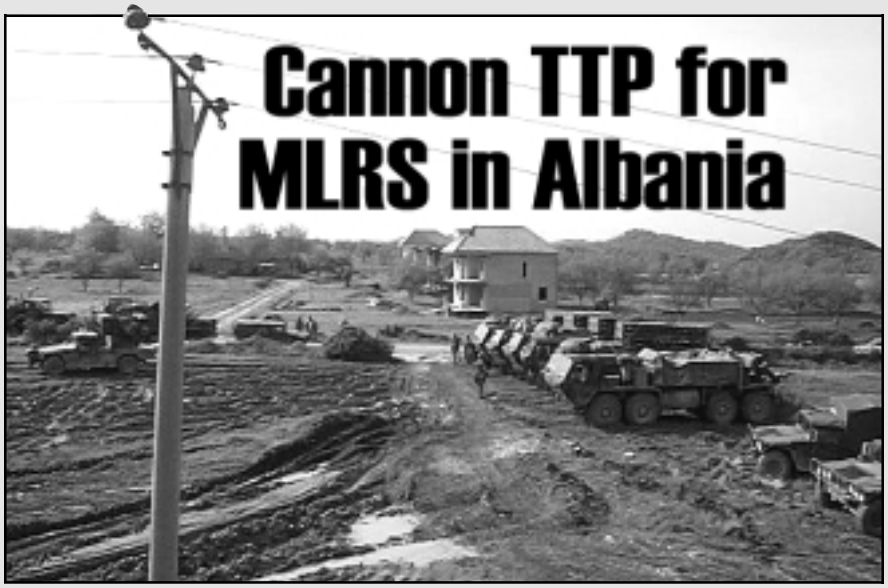


Figure 4: FA communications for TF Falcon relied on the single-channel ground and airborne radio system (SINCGARS) FM radio for its voice and digital traffic. Spitfire TACSATs maintained the command and control link with battalion units in Albania and logistics convoys to and from Camp Able Sentry in Macedonia. Ptarmagin phones, a UK equivalent to the MSE, were the primary means of communicating with the KFOR Headquarters in Pristina, Kosovo, to clear fires.



Cannon TTP for MLRS in Albania

Multiple-launch rocket system (MLRS) tactics, techniques and procedures (TTP) in Albania were dictated by mission, enemy, terrain, troops and time available (METT-T). The classic TTP outlined in *FM 6-60 TTP for MLRS* was less applicable for supporting Task Force Hawk than the TTP in *FM 6-50 TTP for the Cannon Battery.* Neither TTP proved sufficient. This led to our developing three battle drills: Linear, Echelon and Lazy W.

Linear Battle Drill. In this drill, the battery lined up on an abandoned road about 1,500 meters long with approximately 100 meters spread between launchers; the battery operations center (BOC) was in the middle, approximately 200 meters from the closest launchers. The logistics supply points (LSPs) were on both ends of the line about 200 meters from the nearest launcher.

For a linear position area (PA), the commander selected a road with intersections at both ends and, preferably, one intersection in the center. The intersections at the ends made adequate LSPs, allowing the heavy-expanded mobility tactical trucks (HEMTTs) room to maneuver. Most importantly, the intersections provided multiple routes for displacement in the event of overwhelming air or ground attack or counterbattery fire.

To avoid traffic jams along the road at the firing points, we numbered our launchers just like howitzers. This way, depending on the space available, the commander could make the call on the order of march, either heads or tails. LSPs were established once the launchers were in their firing points. This kept the HEMTTs out of the way during occupation.

Echelon Battle Drill. For this drill, the battery occupied a kilometer-square field or plateau with one platoon in front of the other. The five-launcher platoon occupied in a modified star formation—more of a "W" than the star depicted in FM 6-50. The four-launcher platoon went into an offset diamond formation. The distance between the platoons was approximately 200 meters, depending on terrain, and the spread between launchers was 100 to 200 meters. The BOC sat 300 meters to the rear of the formations, preferably on high ground overlooking the platoons. One LSP was established in the vicinity of the BOC.

This drill was slightly more complex in execution. The commander had to select an area with multiple routes in and out, an area with enough space to support the battery's operations and maintain local security. The protecting infantry force preferred to secure a tight perimeter. Optimal or not, the perimeter size that worked was roughly a square kilometer.

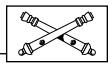
The Echelon Drill required thorough, coordinated advanced party operations. We established survey control points

Our MLRS battalion TOC was not accustomed to working with and integrating fire support personnel. To process counterfire missions, the TPS was integrated into the 1-27 TOC, which later was collocated with the TF FSE. The FSEs from 2-505 IN and the 26th MEU maintained communications with the TF FSE on the TF fire support voice and digital nets. To train the FDC personnel on cannon fire direction and processes, we conducted several small-scale digital exercises and rehearsals, integrating the TF fire support team and refining the battalion's TTP for cannon fires.

The counterfire radars—one Q-36 and one Q-37—in Camp Bondsteel, Kosovo, and one Q-36 in Camp Montieth, Kosovo, began acquiring targets when they became operational. All targets were "unwanted," mostly small-arms fire, but they gave the task force an additional source of intelligence and practice in processing cannon counterfire missions. This was especially useful to L Battery, 26th MEU, at Camp Montieth, which had a large share of incidents of small-arms fire.

In late July 1999, it was over. The battalion's headquarters handed off the mission to 1-7 FA, 1st Infantry Division (Mechanized), and redeployed to the Central Region. TF 1-27 FA and our attached units never fired a round.

Although challenged by changing missions, fielding new equipment and conducting nonstandard operations, the battalion proved its inherent flexibility. The innovative thinking of talented soldiers allowed the battalion to rise above the C^2 challenges we encountered.



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First Lieutenant Cory J. Delger is the battalion Fire Direction Officer (FDO) for the 1st Battalion, 27th Field Artillery, V Corps Artillery and deployed to Albania in support of Task Force Hawk and later to Kosovo as part of Task Force Falcon. Previous assignments in the battalion include serving as a Battery Operations Officer, Ammunition Platoon Leader and Firing Platoon Leader. Lieutenant Delger is a graduate of the Field Artillery Officer Basic Course and MLRS Cadre Course at the Field Artillery School, Fort Sill.

(SCPs) just inside the entry control point (ECP) along a trail leading to the firing points when operating in the thick grass of coastal plains and foothills. In the mountains, the vegetation didn't interfere with our establishing SCPs on the firing points. The platoon leaders had to think on their feet, analyze the terrain and establish SCPs. This was not difficult, but it was time-sensitive, given only one position and azimuth determining system (PADS).

Lazy W Battle Drill. This drill put the battery in a "W" formation across the breath of a narrow plateau. Given the size of the plateau designated as the PA, the firing points for the launchers were 200 to 400 meters apart. The BOC remained in the battery hide area, and an LSP was established at the end of the W between the hide area and the firing points. The hide area was approximately 300 to 400 meters from the nearest firing point at the end of the W and comprised an area of about 300 meters square.

The Lazy W Battle Drill was less advanced party-intensive but more demanding on the section chiefs and operations officer. The advanced party requirements were split between the platoon leaders: one established the battery hide area and LSP while the other established the firing points. The launchers were numbered and the section chiefs knew their positions in the formation. This is critical because each launcher proceeded directly to the battery hide area after arriving in the PA, leaving the hide area only to execute a fire mission. The same launcher fired from the same point based on the piece-to-fire selection made by the operations officer. This reduced the counterbattery threat because launchers moved to firing points throughout the length of the PA, generally three-by-one kilometers, giving the appearance of random fire from random locations.

The challenge was to manage the piece-to-fire selections so they weren't random and followed the scheme of fires. Fortunately in Albania, the majority of our fire missions were pre-planned suppression of enemy air defenses (SEAD). This allowed the operations officer to designate the piece-to-fire early, synchronize movement times with time-on-target or time-to-fire times and rehearse execution.

To facilitate quick ammunition reloads to reduce the signature of the battery in the PA, the LSPs were established between the hide area and the firing points. This allowed the launchers to reload along a single route before returning to the hide area, creating minimum movement in the PA.

Force Protection. While the launchers occupied their respective firing points, the infantry pushed four M2 Bradley fighting vehicles out of the hide area to provide security for the PA. The Bradleys controlled access to the PA while the dismounts provided security for the hide area.

Face-to-face coordination between the infantry company commander was essential to synchronize force protection with the fire plan. The company commander had a copy of the firing windows, so he could synchronize the PA's defensive plan. During the coordination, far and near recognition signals were established for movement in and out of the hide area and around the LSP.

Additionally, the infantry had a signal or code word that indicated when the launchers were about to fire. That information was disseminated down to the section/squad level. To avoid fratricide, the infantry knew every movement occurring in the PA.

Because the infantry secured the PA before the battery arrived, coordination on where to locate the command post (CP) was conducted before the drill began. The infantry CP and the BOC were collocated. Communications equipment, situation maps and charts, and intelligence reports were centralized. The BOC easily incorporated an infantry CP.

In Albania, the overwhelming concern with force protection put an emphasis on tactical solutions to meet the demands of METT-T, limiting employment options. Our battle drills reflect the emphasis on tactical improvisation over technical possibilities.

Captain L. Lance Boothe
Cdr, B/1-27 FA, V Corps, Germany

LINEAR SWEEP

Paladin Prep in Korea

By Lieutenant Colonel Thomas A. Kolditz
and Captain John W. Kallo

If a unit needs to hold the shoulder of a defile as friendly forces breach an obstacle and pass through on the attack, one solution is the classic breach—suppress, obscure, secure, reduce (SOSR). If the suppression and obscuration are both effective and continuous, the timing and interval of the approach march are correct and there are no problems reducing the obstacle, then the essential fire support task (EFST) will be successful.

But an alternative, one that may hold less uncertainty and risk, is to place fires on the enemy position in such volume and with such distribution that the defeat of the enemy position is mathematically guaranteed. This "blunt-instrument" approach is historically proven and likely to succeed—even when the friction or fog of war is intense enough to have disrupted the elegant SOSR ballet. The blunt-instrument approach is particularly effective in Korea and other areas of close terrain where platoon positions on the shoulders of a defile can control both entry and exit to critical maneuver red zones.

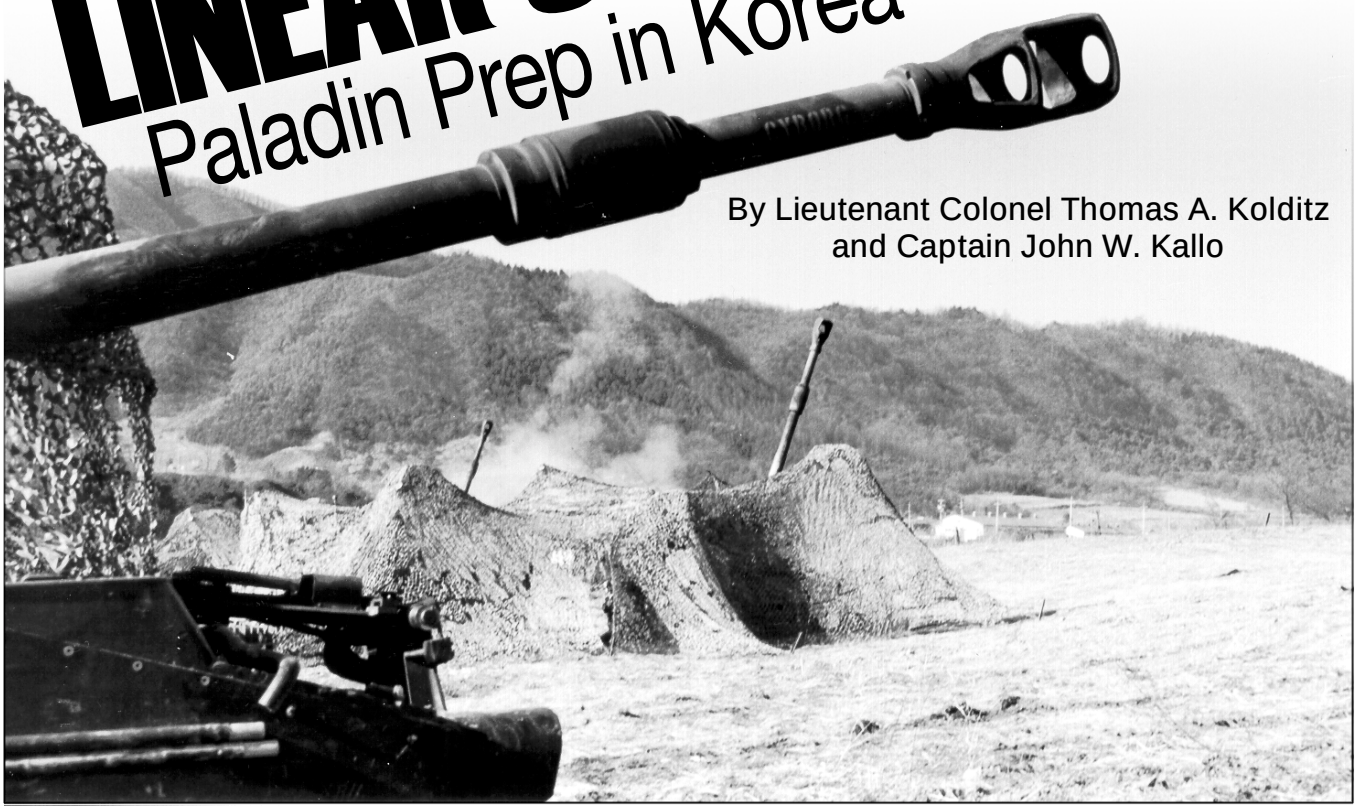
In this article, we discuss the revised and refined art of the artillery preparation: the linear sweep in Korea. We outline how to use the capabilities of the M109A6 Paladin howitzer to put high-volume, evenly distributed fires on dug-in infantry forces and armored vehicles for maximum effects.

Historical Background. Gunners in the former Warsaw Pact armies were particularly adept at planning high-volume fires. During the January 1945 Vistula Oder Offensive Operation, for example, the 8th Guards Army massed 350 artillery pieces per kilometer of breakthrough front.[1] These and other artillery pieces contributed to a 107-minute preparation across the front with one 25-minute segment delivering 315,000 projectiles into the German's collapsing defense.

Such heavy concentrations of fire have an enormous logistical cost associated with them. For that reason and because our artillery developed under Cold War paradigms of being vastly outnumbered by enemy guns, the US Army has not trained extensively to deliver high rates of highly lethal fires. We've used very lethal improved conventional munitions (ICM) and very efficient technical and tactical fire direction systems, substituting precision and responsiveness for the brute force of tons of explosives.

High-Volume Fires. In our combined arms warfighting doctrine, we often practice the *suppression* of known enemy locations, in theory, allowing maneuver forces to gain positional advantage to defeat or disrupt the enemy. This is a necessary tactic in many instances, but sometimes it makes more sense for the maneuver force to exercise tactical patience while artillery renders the target completely ineffective rather than temporarily suppressed. Suppression, unfortunately, is like the matador's cape—it's effective for a short time, but if it's inadvertently dropped, you have to deal with the bull.

Recently, a respected maneuver commander "graded" a fire support officer (FSO) on providing effective suppression at a breach. He said, "If a friendly vehicle is destroyed in the support-by-fire position or the breach, you get a 'D.' If two friendly vehicles are destroyed, you get an 'F.'" At that point, the FSO—who was an "A" student—inferred the intent for fires was to destroy, rather than suppress, the overwatching enemy attack-by-fire positions. So, in concert with his fire support coordinator (FSCOORD), he put more than 350 rounds of dual-purpose improved conventional munitions (DPICM) on the target—an immediate and permanent solution to the problem. No friendly vehicles were destroyed during the breaching operation. A 300-



C/2-17 FA, Paladin

by-300-meter or 300-by-600-meter position is well within the capabilities of a focused artillery battalion to take down with a high volume of fires.

What constitutes a "high volume" in this instance? In Chris Bellamy's classic work on Soviet artillery, *The Red God of War*, the Soviet process for computing such fires is explained in mathematical detail. Using the calculations, "norms can be obtained which will practically guarantee the destruction of any target if the rules are followed."[2] His term "any target" includes dug-in tanks and infantry fighting vehicles and dug-in infantry.

The assumption is that an artillery round must strike or nearly strike the reinforced targets to achieve a kill. The computations are organized in tables for easy use in the field. The Soviet term for "suppression" means 30 percent destruction of the enemy force—the US artillery's doctrinal requirement for destruction fires. (See Figure 1.)

Current North Korean doctrine promulgates this same approach using Warsaw Pact and the North Korean People's Army (NKPA) howitzers, such as the 170-mm Koksan gun, the M1973 152 self-propelled (SP) and heavy mortars. Intelligence officers sometimes dismiss the effectiveness of these pieces because of their inaccuracy. But high rates of fire actually take advantage of the inaccuracy of large circular error probable (CEP) weapons to achieve an ellipsoidal, relatively even distribution of effects on area targets.

When adroitly employed, modern howitzers, such as Paladin, can produce even better effects. The accuracy provided by individual piece corrections, aim points by piece, the rapid application of meteorological data and other technological advantages now enable the FSCOORD to pattern the distribution of effects across the targeted position deliberately.

In addition, the use of palletized load system (PLS) vehicles—organic to mechanized direct support (DS) battalions—make the expenditure of 300 to 600 rounds on an EFST well within the organic capability of the battalion. The battalion can resource such a volume of fires within its typical unit basic load (UBL) and estimated daily controlled supply rates (CSRs). The 350 rounds for an EFST represents less than 10 percent of most UBLs and about three of the 18 PLS flatracks generally available to the FSCOORD.

A Battery of Towed Guns, Ranges up to 10 Kilometers								
	Rifled Weapons			Mortars			Rocket Launchers	
Caliber, mm	122	130	152	120	160	240	Medium	Heavy
Number of Rounds	220	200	180	200	120	100	400	170
A Battery of Self-Propelled Guns, Ranges up to 10 Kilometers								
Caliber, mm	122	130	152	120	160	240	Medium	Heavy
Number of Rounds	380	260	290	300	290	175	440	210

Figure 1: Table of Norms for Suppression (30 Percent Destruction) for a 200-by-300-Meter Position (*The Red God of War,* Christopher Bellamy, Page 65)

Distributing Effects. It's the even distribution of effects, not just the volume of fires, that kills. The Soviets merely used volume to achieve distribution. We know from classified studies of munitions effects that to render mobility, firepower or communication kills on tanks and achieve crew and catastrophic kills on lightly armored vehicles most effectively, high-explosive (HE) rounds must land on top or within a few meters of the armored vehicles. Even distribution across area targets is particularly important when vehicles are dug-in, but such vehicles *can* be rendered ineffective by near airbursts or ground bursts on or inside their defensive berms.

This reveals a fallacy in training exercise rules of engagement (ROE) that require a certain level of explosive weight to kill a target (for example, 108 artillery rounds to kill a tank). It only takes one round if the density and distribution puts the projectile on or within a few feet of the target.

ICM projectiles increase the efficiency of the process by distributing bomblets rather than fragments. When time permits and especially in support of light infantry, densely distributed HE fires also can be effective on all known armored vehicles.

Given that we want to achieve an even distribution of fire across a position, what are the tactics, techniques and procedures (TTP) for the Paladin to achieve that distribution? The example in the current *FM 6-40 TTP for Field Artillery Manual Cannon Gunnery* for engaging a 300-meter area target is battery fire using six aim points. This is obviously appropriate only for the temporary suppression of lightly armored or unprotected troops—*hardly* representative of the "King of Battle."

The solution to the problem has two components: high-volume fires and a deliberate distribution of effects. Paladin's consistency and accuracy make the deliberate, even distribution of effects necessary to prevent pounding a few parts of an area target while missing others. Taking into account the tabular firing table's (TFT's) predicted range and lateral spread, anyone who has spent time "on the hill" can verify that multiple rounds fired from single howitzers tend to land close to one another—sometimes with craters touching at the shorter ranges. An even distribution of effects on an area target simply cannot be achieved with only a few aim points.

Historically, an alternative gunnery technique for distributing effects between volleys was to roll a barrage across a large enemy position—in Soviet terminology, a "fire curtain."[3] This was done by using the optical sight, adjusting quadrant by a few mils between volleys (zone fire), adjusting deflections between volleys (sweep fire), or adjusting both deflection and quadrant between volleys (sweep and zone fire).

The M100 series optical sight in the Paladin can be used for sweep and zone fire, but many of the technical advantages of the howitzer are lost when the optical sight is in use. The procedures for sweep and zone fires (FM 6-40 "Appendix H, Special Situations") are designed to quickly engage a large and (or) irregularly shaped target; the computations are based on using the weapon's burst width to determine sheaf front (sweep fire) or sheaf depth (zone fire). With advanced technology and automated fire direction procedures and delivery systems, traditional sweep and zone techniques require adaptation from older optical sights to the capabilities inherent in Paladin's automated fire control system (AFCS).

In addition, the distance between bursts should be decreased to less than a burst width. By decreasing the distance be-

tween bursts, the fire direction officer (FDO) can deliver fires that saturate the target area and maximize the effects against enemy assets and forces in the target area.

Linear Sweep—How To. One tested and effective TTP to deliver such dense area of fires is called a "linear sweep." Simply put, a linear sweep takes a dense, linear target computed by the Paladin's AFCS and sweeps it across the enemy position using a series of small subsequent corrections. These corrections are planned ahead at the platoon operations center (POC), so immediately after the POC receives "Shot" from the first volley, it sends a subsequent correction to each howitzer. One-round-per-minute sustained rates of fire can be achieved (and even surpassed) during this mission.

Recently, the Chief of Infantry wrote a penetrating article on fire support in the close fight and referred to the preparation as a "dying art."[4] The linear sweep is a preparation art form alive and well at the DS level and well suited to Paladin's capabilities.

The linear sweep provides an overwhelming volume of fire with incremental shifts in impact location, "carpeting" a designated target with indirect fires. Under ideal conditions, all the battalion's 18 Paladin howitzers fire 18 rounds each into a 300-meter-square target area, thus expending 324 rounds. (See Figure 2.) The box in Figure 2 covers a 300-meter-square platoon position when using HE with point detonating (PD) fuzes and is expanded to a 600-meter-square box when using DPICM.

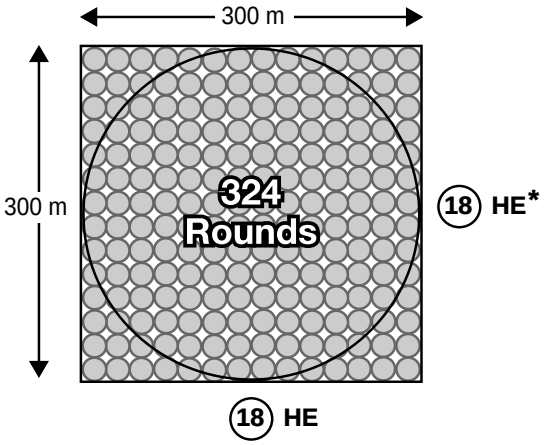
After the initial linear volley, rapid subsequent corrections form an area sheaf that ensures an HE projectile will impact less than eight meters from every enemy vehicle in the box (on an average). The close proximity of these impacts should achieve kills (defined as catastrophic, mobility, communications or fire control) on *all* vehicles and more than 75 percent of all personnel in the target area, *regardless* of their protective posture. The ICM linear sweep achieves a similar effect with 88 submunitions spaced within 16 meters of each vehicle in a 600-meter box.

The following outlines the linear sweep's initial computation steps, its execution, time parameters and adjustment techniques. Additionally, we discuss procedures for executing the mission with a reduced number of howitzers.

Initial Computation. The linear sweep can be conducted as either a planned target or a target of opportunity. First, the controlling maneuver commander determines the location of the box and the controlling FSO determines a center aim point. Based on this information, the battalion FDO uses an attitude appropriate for the target area to add 150 meters (in the case of DPICM, 300 meters) to the center aim point, based on the 300-meter or 600-meter box, respectively. This provides the top (first linear sheaf) of the target box and defines the target area.

This initial linear sheaf is then segmented into six platoon-sized sheafs. The battalion fire direction center (FDC) determines the six platoon center aim points using chart paper or a map. The quickest method is to use a template with a mark for the center aim point and holes to mark each platoon's sheaf center aim point.

Once determined, the FDC transmits the aim points to the individual POCs via digital plain text message (the preferred method) or voice as a priority target. Each POC uses the aim point to compute a 50-meter linear target for its firing platoon, employing an "At My Command" (AMC) method of control. Once all the guns are laid on their initial aim points, the POCs report "Ready" back to the battalion FDC in preparation for mission execution. No special procedures are required by the POCs or howitzers and mission training plan (MTP) standards apply to both the computations and the crew drill.



*HE is used for simplicity. Dual-purpose improved conventional munition (DPICM) missions are identical in execution, but a 600-meter battalion linear target and subsequent corrections of 33 meters create a 600-by-600-meter effects pattern.

Figure 2: Linear Sweep Effects Pattern using High Explosives (HE)

Execution. The initial volley of the linear sweep is conducted under the direction of the battalion FDC to maximize the elements of mass and surprise on the target. The initial volley is fired on the top of the box as determined by the controlling FSO or the battalion FDO. For the HE mission, all subsequent corrections are a "drop 15"; for the ICM mission, the corrections are a "drop 33." To further confuse the enemy as to where and when the next rounds will impact, succeeding volleys are fired by the individual howitzer sections using a "When Ready" (WR) method of control. The observer-target (OT) direction is kept at a constant 6,400 mils to maintain the target box's alignment.

Time Parameters. Once the target location is received, the battalion FDC needs eight minutes for tactical and technical fire direction and transmission of the POCs' initial aim points. The POCs and guns require one minute and 35 seconds for technical fire direction and the howitzer crew drill.

The MTP standard for firing an "At My Command" linear target with 17 subsequent corrections at low angle is 22 minutes and 30 seconds. The test battalion for the TTP executed this mission live-fire in 21 minutes and 10 seconds. The MTP standard for high angle is 28 minutes and 30 seconds. The same battalion fired its high-angle mission in 24 minutes and 25 seconds. (When establishing the time standards, one battery live fired the missions due to the restrictive nature of firing in the Republic of Korea; the remainder of the battalion simultaneously dry fired the missions).

Adjusting Methods. If the FDO needs to adjust the target box, he determines the method of adjustment by the size of the adjustment or refinement. When the initial target location refinement is less than 1,000 meters, the POCs are notified of a correction for the initial volley with "Cease loading target number xxxxxx; shift correction left [or right] xxx meters and add [or drop] xx meters." The POCs compute the data for the new aim points, and the mission is ready for execution on the refined

target box. A correction of this type requires two minutes and 10 seconds of technical procedures from the battalion FDC to the POCs and down to the gun line. Refinements of more than 1,000 meters require the FDC to recompute the mission, especially if there is an altitude change of more than 100 meters.

In the case of a mission with non-fleeting targets, an adjustment round is used to verify target location. While this eliminates the element of surprise, it may be acceptable to ensure destruction of a high-payoff target (HPT).

Density of the Prep. FM 6-40 "Appendix H, Special Situations" discusses the special fire distribution techniques necessary to ensure proper coverage and ammunition usage when engaging large targets (larger than 250 meters). The FM 6-40 solution for a 300-meter-square area target, for example, places six guns on only six aim points.

Linear sweep is a much more aggressive use of artillery fires and is a Paladin version of earlier sweep and zone techniques used with optical sights. The large size of the target and the high density of fires accounts for minor target location errors (TLEs), various target types and all protective postures in which the enemy force can array itself. Put simply, the linear sweep is absolutely lethal.

If friendly howitzers are lost, the linear sweep still can be executed effectively. The only significant change is reducing the size of the target box to be engaged. By doing so, the TTP attribute of density of effects is not diminished. Based on the TTP's foundation, 18 tubes provide the optimal coverage for the 300-meter-square target box. The same density of coverage can be achieved on a 250-by-300-meter box when 15 howitzers are available and on a 200-by-300-meter box with 12 howitzers (the Soviet platoon position). The corresponding coverage using DPICM is 18 tubes for a 600-meter-square box, 15 tubes for a 500-by-600-meter box and 12 for a 400-by-600-meter box. The execution times remain the same for these reduced target sizes, and the effects are dramatic to observe.

Moving Targets. The linear sweep can be adapted to engage fleeting targets. Instead of moving the fires in the box from the "top" edge to the "bottom," the initial sheaf is fired across the center aim point for the initial volley. The succeeding volleys are fired by directing alternating add and drop corrections. This allows the firing unit to walk the fires from the center to the top and bottom edges of the target box to maximize effects against a displacing enemy force.

Training the Fire Support System. The fire direction and fire support portions of the DS battalion killing system must be trained on linear sweep TTP. In effect, the linear sweep is the revival of the preparation at the lowest possible level—the enemy platoon position. As with all TTP, repetitive drills involving all elements of the system are vital.

The FDO must be able to anticipate and manage the unique aspects of the TTP, such as aligning his linear target and anticipating subsequent corrections. The FSO must practice setting conditions for the use of the technique, making rapid adjustments and managing execution time. Section chiefs and gunners must understand the sense of urgency required to maintain the tempo of firing. In our brigade combat team in Korea, the linear sweep EFST often was assigned to Apache pilots who were setting conditions for a subsequent air assault.

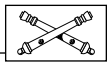
All parts of the fire support system must train with the TTP until they are comfortable and then rehearse until they can perform under the stress of execution. Resources permitting, it should be rehearsed live.

Units must be careful when using minimum safe distances (MSDs) and risk estimate distances (REDs) to conduct high-volume live fires. The peacetime MSD and wartime RED buffers against fratricide are computed on the basis of probabilities.[5] That is, given the terminal ballistics and range/lateral probable errors (PEs) associated with firing, the likelihood of injury to approaching troops is estimated and a small buffer is established for combined arms training and combat.

Trainers should be particularly conservative using probability-based buffers during events featuring high volumes of artillery fire because each round is a single probability trial. It is obvious that probability-associated effects from a battery-six versus a battalion-18 is different and more dangerous in the latter case.

High-volume fires are a twist to the more common "suppressive" approaches to close support, and many infantrymen and fire supporters are initially skeptical about a shift in paradigm. Some will argue that using high-volume fires is unrealistic and logistically prohibitive—show them the math. Some will argue that high-volume fires are overkill and a waste of ammunition—introduce them to Murphy and the fog of war. Others may argue that tanks and infantry with 18 inches of overhead cover can't be decisively engaged by artillery—show them the tapes. If training realism is maintained by adjudicating 90 percent to 100 percent kills on the maneuver forces struck by properly computed high-volume fires, the technique will sell itself.

The point is that the linear sweep is timeless. Doctrine and weapons systems are just tools. And they are only as good as the effects they produce. The onus remains on the fire supporter to be a master craftsman, to get the job done for the maneuver commander—and remain the *King of Battle* in the close fight.



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Captain John W. Kallo is the Battalion Fire Direction Officer (FDO) for 2d Battalion, 17th Field Artillery in the 2d Infantry Division, Korea. Previous assignments include serving as Battalion FDO, Battalion Adjutant, Platoon Leader, Platoon FDO and Company Fire Support Officer, all while assigned to the 3d Battalion, 82d Field Artillery, 1st Cavalry Division at Fort Hood, Texas. He is a graduate of the Field Artillery Officer Basic Course, Fort Sill, Oklahoma.

Endnotes:

1. Christopher Bellamy, *The Red God of War*, (New York: Brassey's Defence Publishers, 1986), 65.
2. Ibid., 182.
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MAJ Robert Bettencourt, ATO Team Chief, Roving Sands 99 (Photo by SSG Regina Height, 1st Combat Camera)

ATO Teams
Connectivity for the Deep Fight

by Colonel Mark A. Graham,
Lieutenant Colonel Chris A. Hood, ARNG,
and Major M. Robert Bettencourt III, ARNG

Working in a joint and combined environment is the norm for Army units. Peace-enforcing or peacekeeping operations in Bosnia, Kosovo and world disaster assistance in Turkey are proof of our need to work closely with our sister services and allies.

During the 1999 Roving Sands exercise at Fort Bliss, Texas, the 40th Infantry Division (Mechanized), California Army National Guard (ARNG), replicated an Army force (ARFOR) headquarters in support of a joint task force (JTF). Roving Sands 99 was the first time the ARFOR was configured as a robust cell that fully "played" the ground force. It also was the first time a National Guard division served as the ARFOR headquarters. If you think your unit will never have to do this—think *again.*

After an initial "What is an ARFOR?" briefing by Operations Group D of the Battle Training Command Program (BCTP), Fort Leavenworth, Kansas, we realized the usual deep operations coordination cell (DOCC) configuration and operations would not suffice. We needed a better way to plan deep operations, provide continuity from air tasking order (ATO) to ATO and use all assets from other services and, possibly, other nations. We needed to ensure connectivity to all involved. Whether your unit serves as an ARFOR or a joint force land component command (JFLCC), it must be able to move beyond the normal DOCC configuration.

Two developments emerged from our wargaming. First, we revised the DOCC organization and changed its name to the operational fires element (OFE). This ensured everyone understood it was not exactly like the DOCC, although it performed the DOCC functions and more.

Our second development was the ATO team, part of the OFE. The full complement of intelligence and deep-strike assets available to the commander of the ARFOR (COMARFOR) required rotating ATO teams, each dedicated to planning one ATO at a time, starting 120 hours out. Our ATO teams allowed the ARFOR staff to logically portray a very dynamic battlespace to its commander.

The ATO teams took the commander's vision and intent for deep operations and created a plan to execute his intent. The teams accessed the entire suite of intelligence and fire support systems that "see" the commander's battlespace, translated his essential fire support tasks (EFSTs) into recommended target sets and tracked them on their ATOs. Each team tracked the fight and its ATO until its ATO was executed and then began the process again with a new ATO.

During Roving Sands, these teams became a focal point for shaping the

fight. Senior leaders and other battlefield operating system (BOS) staff officers began to use the ATO team cycles to integrate the ARFOR commander's fight. For example, tasking remotely piloted vehicles (RPVs) was briefed and approved at the daily ATO decision briefings to the commander—just one of many systems briefed to the ARFOR commander. The staffs worked together to determine how best to integrate the assets of the entire force in the overall scheme; they worked 96 to 120 hours out to provide senior leaders more details and synchronization options.

This article outlines the organizational changes we made to implement our OFE to accommodate the ATO teams and discusses ATO team operations. Our OFE and the ATO teams came with organizational and equipment costs, but the benefits gained in Roving Sands were exponential. III Corps is studying them for possible implementation.

Organization and Equipment. The organization of the ARFOR headquarters was one of the first concerns addressed by our command staff, our coaches from BCTP and Roving Sands participants, the 1st Battlefield Coordination Detachment (1 BCD) out of Fort Bragg, North Carolina, and III Corps out of Fort Hood, Texas.

Funding and real-world issues dictated the final structure for our personnel, equipment and communications requirements. However, we did not consider funding constraints in our initial mission analysis. We used the 101st Airborne Division's draft ARFOR manning model; the III Corps tactical standing operating procedures (TACSOP); our own BCTP Warfighter 98 experience with I Corps; organizational aids; and mission, enemy, terrain, troops and time available (METT-T) to determine our ARFOR headquarters manning for Roving Sands.

We decided that neither a rear nor a forward ARFOR headquarters section was required. G1 and G4 were not involved in Roving Sands 99 but would normally impact the OFE and the ATO team process. In fact, 24-hour operations were not being dictated; the exercise modeled a single daily 12-hour shift. We concluded that with only a 12-hour shift to manage, there were enough personnel in the division main tactical operations center (TOC) and division command post (TAC) to man the OFE.

Our coaches validated our OFE model as we progressed through institutional training and SOP rehearsals. For maximum development of soldier skills, we chose to cross-train personnel once the exercise started.

Equipment. The 40th Division fielded its own tactical local area network (TAC LAN), including laptop computers for the four ATO work stations. However, the division's intelligence and fire support sections could not communicate tactically with our higher headquarters due to equipment challenges.

For example, the 40th Division Artillery uses the initial fire support automated system (IFSAS) as its fire support digital interface. A limitation of IFSAS is its reduced efficiency in managing digitally within a large operational environment. However, III Corps Artillery provided us advanced FA tactical data systems (AFATDS) with operators and supervisory personnel: one AFATDS for the OFE, one for the FA intelligence officer (FAIO), one for the aviation brigade/Army airspace command and control (A^2C^2) cell and one for the fire support element (FSE). This augmentation, along with additional digital systems for the intelligence sections, not only facilitated future and current operations, but also provided our soldiers and supervisors a great training opportunity. External digital communications with the BCD and player cells were enhanced by the AFATDS augmentation.

Personnel. On the personnel side, we enhanced the division's DOCC with four ATO teams and called the DOCC an OFE. Figure 1 shows the fire support personnel in the division's modified table of organization and equipment

Fire Support Element	Rank	OFE Personnel	Auth	MOS
FSCOORD	COL	FSCOORD	1	13A
DFSCOORD	LTC	DFSCOORD	1	13A
AFSCOORD	MAJ	ATO Team Chief	4	13A
FA Intelligence Officer	MAJ	FA Intelligence Officer	1	13A
Target Analyst	CPT	Target Analyst	1	13A
Targeting Officer	CW4	Targeting Officer	1	131A
FA Intelligence Officer	CW3	FA Intelligence Officer	1	131A
Fire Support Sergeant	SFC	Current Fires NCO	1	13F40
Fire Support Sergeant	SSG	ATO Team Assistant	2	13F30
Fire Support Sergeant	SGT	ATO Team Assistant	1	13F20
Senior Radio Operator-Maintainer	SGT	Communications NCO	1	31C20
Fire Support Specialist	SPC	ATO Assistant	1	13F10
Radio Operator-Maintainer	SPC	Communications Specialist	1	31C10
Fire Support Specialist	SPC	Current Fires	2	13F10
Admin Specialist	SPC	Current Fires	1	71L10
Radio Operator-Maintainer	PFC	Communications Specialist	1	31C10
Intelligence Sergeant	MSG	OFE NCO	1	13Z50
		Total	**22**	
		Additional Personnel		
	EM	Intelligence Analyst	2	96B
	CPT	BCD LNO	1	13A
	LTC	JFACC LNO	1	13A
	LTC	JTF Fires	1	13A
	NCO/EM	AFATDS Augmentation	6	13C
		Total	**11**	

Legend:

AFATDS = Advanced FA Tactical Data System
AFSCOORD = Assistant Fire Support Coordinator
ATO = Air Tasking Order
BCD = Battlefield Coordination Detachment
DFSCOORD = Deputy Fire Support Coordinator
FSCOORD = Fire Support Coordinator
EM = Enlisted
JFACC = Joint Force Air Component Command
JTF = Joint Task Force
LNO = Liaison Officer
MOS = Military Occupational Specialty
OFE = Operational Fires Element

Figure 1: Army Force (ARFOR) Fire Support Manning for Roving Sands 99

(MTOE) used for the FSE and OFE, including the additional personnel needed.

Each team covered a different ATO period. The team had one assistant fire support coordinator (AFSCOORD), an FA major, and one Military Occupational Specialty (MOS) 13F20 Fire Support Specialist. The four teams shared two MOS 96B Intelligence Analysts and had an overall NCO-in-charge (NCOIC) who managed the enlisted issues for the teams. (The ARFOR OFE would need additional personnel for 24-hour operations.)

The deputy fire support coordinator (DFSCOORD) was responsible for the productivity of the four teams. The senior AFSCOORD served as the officer-in-charge (OIC) for the teams. Each AFSCOORD assembled his team's information and products into "Power Point" slides used for the targeting meeting and decision briefing. These slides covered each functional area of the four ATOs in progress at a time.

Although the size of the briefing was large, a laptop computer with a Zip drive per ATO team allowed the team to display the commander's focus on its screen. Between briefings, the screen saver showed the high-payoff target list (HPTL) and automatically rotated through the commander's update from the TAC LAN. This ensured everyone in the OFE knew the commander's focus and the current situation.

The DFSCOORD also played a major role in prioritizing the ATO target submissions. He arbitrated which targets received priority. Once an ATO was published, the DFSCOORD reviewed the list to ensure any key targets not on the ATO were "rolled" onto another ATO or deleted in favor of attack by a different system. He also recommended re-strikes for some critical targets where no battle damage assessment (BDA) was available to ensure we achieved the commander's intent regarding effects. Sometimes a target was not attacked because a higher priority target presented itself in the same area; as necessary, he renegotiated the inclusion of the target on another ATO.

The DFSCOORD played a key role. In 24-hour operations, the multiple-launch rocket system (MLRS) battalion commander is the most likely person to work this all-important split shift with the DFSCOORD. Deep operations are continuous in this environment even though Army deep operations normally are executed at night.

Many special staff members participated in deep operations planning and execution, but one component we had never used previously was a staffer from the Space Command. An Army lieutenant evaluated concerns about communications degradation and the accuracy of global positioning systems (GPS) as they might be affected by solar activity. The Space Command representative also provided terrain-based imagery and much more.

ATO Team Operations. The myriad of intelligence platforms and deep-strike assets available to an ARFOR required a dedicated team focused on planning only one ATO at a time. The ATO teams worked to look at all options at the disposal of the ARFOR commander. They followed a daily cycle that displayed their major ATO responsibilities for that period.

Because each ATO covers attack flights in a 24-hour period and ATOs are planned at the ARFOR level as far as 120 hours out (i.e., four days beyond the current day), we used four ATO teams in rotating fashion. Each team followed an ATO for four days; on the fifth day, the FSE picked up responsibility for the ATO during its execution and battle damage assessment while the team began a new ATO cycle. Each of the four ATO teams planned ATOs out for the next one, two, three and four days, respectively. Figure 2 shows the ATO team tracking and development cycles. (Individual ATOs in Roving Sands were identified by letters A through N.)

Candidate Target List (CTL). The ATO teams produced a list of targets to be nominated for the joint force air component command (JFACC) to engage, normally by fixed-wing JTF aircraft commonly referred to as "Blue Air." Each day, we forwarded a new CTL (see the example CTL in Figure 3) to the BCD, the ARFOR's liaison to the USAF-dominated JFACC. We tasked an FA captain to be our liaison officer (LNO) to the BCD, thus ensuring the JFACC clearly understood the rationale behind the CTL targets.

Each CTL was the culmination of detailed analysis and planning by representatives from the G2 and G3 plans

								ATO-J
							ATO I	Plan
						ATO H	Plan	BCD
					ATO G	Plan	BCD	JIPTL Pub
				ATO F	Plan	BCD	JIPTL Pub	ATO Pub
			ATO E	Plan	BCD	JIPTL Pub	ATO Pub	Fly E
		ATO D	Plan	BCD	JIPTL Pub	ATO Pub	Fly D	Assess
	ATO C	Plan	BCD	JIPTL Pub	ATO Pub	Fly C	Assess	
ATO B	Plan	BCD	JIPTL Pub	ATO Pub	Fly B	Assess		
ATO A	Plan	BCD	JIPTL Pub	ATO Pub	Fly A	Assess		
11 Jun	12 Jun	13 Jun	14 Jun	15 Jun	16 Jun	17 Jun	18 Jun	19 Jun
Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat

Figure 2: During Roving Sands 99, four ATO teams each worked an ATO for a four-day cycle with the fire support element (FSE) picking the ATO up for its execution and assessment. This figure shows 10 of the 14 ATOs tracked and developed by the teams during the exercise.

Requested AI Missions for ATO K

ARFOR Pri	BE#UIC	Name	Latitude	Longitude	Req#	Desired TOT	Desired Effects	JFACC Pri	Remarks
1		HQ IV Corps SA-6 Bde	325000N	1040700W	3E2501N	251200Z	Attrit 50%		AY0010
2		HQ IV Corps SA-8 Bde	325600N	1042100W	3E2502N	251215Z	Attrit 50%		AY0011
3		HQ 42 MR Div SA-6 Bde	322500N	1054500W	3E2503N	251300Z	Attrit 50%		AY0023
4		HQ 44 IN Div SA-6 Bde	321700N	1053300W	3E2504N	251245Z	Attrit 50%		AY0037
5		HQ 41 AR Div SA-6 Bde	325500N	1045000W	3E2505N	251300Z	Attrit 50%		AY0017
6		HQ 43 IN Div SA-6 Bde	331100N	1050300W	3E2506N	251315Z	Attrit 50%		AY0030
7		HQ 64 IN Div SA-6 Bde	333600N	1050500W	3E2507N	251330Z	Attrit 50%		AY0044
8		IV Corps SS-21 Bde	324800N	1040500W	3E2508N	251400Z	Attrit 30%		AY0006
9		IV Corps Helicopter Bde	325000N	1041900W	3E2509N	251500Z	Attrit 30%		AY0007
10		Rail Yard	325010N	1034501W	3E2510N		Neutralize for 72 Hours		AY0085
11		Rail Junction	325012N	1035119W	3E2511N		Neutralize for 72 Hours		AY0086
12		Rail Bridge	324904N	1021603W	3E2512N		Neutralize for 72 Hours		AY0087
Requested Special Missions									
		(None for this ATO.)							
Pre-Planned ATACMS Missions									
1		SA-6 Battery	330100N	1035900W		250300Z	Neutralize for 24 Hours		AY0088
2		HQ 64 IN Div	333100N	1050000W		250300Z	Attrit 30%		AY0039
3		HQ 43 IN Div	331100N	1045400W		250400Z	Attrit 30%		AY0025
4		IV Corps CSS Bde	325800N	1040900W		250400Z	Attrit 30%		AY0009
Pre-Planned Army Aviation Missions									
1		41 AR Div SS-21 Bn	325000N	1045000W			Attrit 50%		AY0018
2		34 Tank Bde 42 MR Div	321700N	1043500W			Attrit 30%		AY0022

Legend:

AR = Armor
ARFOR = Army Forces
Bde = Brigade
BE = Battlefield Encyclopedia
Bn = Battalion
CSS = Combat Service Support
Div = Division
HQ = Headquarters
IN = Infantry
JFACC = Joint Force Air Component Command
MR = Motorized Rifle
SA = Soviet-Made Antiaircraft Missile
SS = Surface-to-Surface Missile
TOT = Time on Target
UIC = Unit Identification Code

Figure 3: ATO Team K Candidate Target List (CTL)

cells working as part of the team for the period four days out (current plus four, or C+4). The following day (i.e., C+3), that CTL would be finalized and sent to the JFACC via the BCD.

Each day we briefed the COMARFOR on the four upcoming ATO periods, soliciting his approval for the CTL to be submitted that day (for C+3) and obtaining his intent for operational fires to be staffed and then published as our CTL the following day. The goal was to complete the COMARFOR's daily decision briefing within an hour, which allowed an average of 15 minutes per upcoming ATO. Each iteration required an appearance by several key personnel to discuss each period's CTL, including the G2, G3 and ATO team chief.

The joint air operations center (JAOC) occasionally denied CTL targets after the list was submitted on C+3. Daily briefs for C+2 and C+1 explained to the COMARFOR which of the nominated targets were denied and the reason for denial. The JAOC published its formal refinement for C+2 in a daily joint integrated prioritized target list (JIPTL). Following an analysis by the appropriate ATO team chief and the DFSCOORD, the JIPTL allowed the COMARFOR to direct other assets against targets "below the cut line" or to re-nominate them on the pending CTL.

The discussion for C+4 was especially crucial because it gave the COMARFOR the opportunity to focus planning for the next day's CTL. If, for example, a number of Scud launches were detected via satellite imagery, the COMARFOR might direct additional intelligence platforms be sent to the area and deep-strike assets be planned for engagement if launchers or missile caches were identified.

The teams worked together throughout the day to keep situational awareness. They conducted backward planning, especially the planning related to fire support coordinating measures (FSCMs), so critical information was disseminated in a timely manner. For example, changes to coordinates of the fire support coordination line (FSCL) had to be sent to the JFACC at least 12 hours in advance. This meant the team for an ATO immediately preceding the expected movement of an FSCL had to give a warning order in its CTL; the order to move the FSCL would come in the next team's CTL.

Operational Fires Focus Graphics. One of initiatives was the operational fires focus graphic. Using Power Point on a laptop computer, the map graphic showed where the enemy was expected to be as of any given ATO and where operational fires were planned, based on the COMARFOR's intent for the day. The map depicted the COMARFOR's

1. Operational Fires Focus

2. Target Lists: Supported/Unsupported Joint Integrated Prioritized Target List (JIPTL) or Candidate Target List (CTL)

3. Pre-Planned Army Aviation Mission Fragmentary Order (FRAGO)

4. High-Payoff Target List (HTPL)/Target Selection Standards (TSS)/Attack Guidance Matrix (AGM)

5. Weather Information

Figure 4: ATO Binder Index—Air Tasking Order (ATO) Cycle Information

priorities. Notes at the bottom of the map explained the proposed task, purpose, method and effects (TPME) for each priority.

The graphic was not only a great way to quickly disseminate lots of information in the decision briefing, but also a great tool for the BCD to use when lobbying for limited JFACC assets. Similarly, it was *the* tool used by the COMARFOR's representative to the joint targeting coordination board (JTCB). That representative (we made this a lieutenant colonel slot) explained why ARFOR nominations needed to be satisfied fully as opposed to the competing requests from, for example, the Marine force (MARFOR), Navy force (NAVFOR) and even the JFACC itself.

ATO Binder. During Roving Sands, we designed the ATO binder. (The binder's index is shown in Figure 4.) We put the two basic documents for each upcoming ATO period (the CTL/JIPTL and the operational fires focus) into that binder. The format for the COMARFOR's daily decision briefing and the day's timeline were posted up front (see the example in Figure 5). The timeline helped orient the COMARFOR to each day's discussion as we moved rapidly through the briefing; the overview of all pertinent ATO periods posted as a graphic above the briefing map (overview shown in Figure 2) also helped orient the COMARFOR.

The documents for each day were divided in the ATO binder by tabs, allowing the COMARFOR to move to the next day's documents as easily as flipping a page. For example, ATO K was briefed until the commander decided on the plan for that day, then the tab was turned and the briefing for the next day's ATO (ATO L) began.

The products were color-coded to be discerned at a glance. For example, the products for ATO K were highlighted with yellow, one of the four colors we rotated through with each team. The colors (red, green, yellow and blue) remained with the same ATO team throughout the exercise.

Each ATO team kept a copy of the two basic documents (the CTL/JIPTL and the operational fires focus) in a folder called the "football." Once the day for execution of the ATO arrived, this "football" was "handed off" to the FSE for management while the ATO team started a new folder for C+4.

A key to this ATO team concept is its flexibility to fit any theater or operation. Whether you use two, three or four teams, the concept remains intact.

The 40th Division had the opportunity to build on an early success in Warfighter 98 and share the deep operations expertise of two corps. To ensure our COMARFOR could synchronize his intelligence and attack assets for the best effects on target to meet his intent, we revised the DOCC structure to be an OFE with ATO teams. Necessity, being the Mother of Invention, prompted 40th Division innovations, which were successful during Roving Sands 99.

ATO-O	G2 Focus	96-120 Hours	(29 Jun 99)
ATO-N	CTL to BCD	72-96 Hours	(28 Jun 99)
ATO-M	JIPTL Published	48-72 Hours	(27 Jun 99)
ATO-L	ATO Published	24-48 Hours	(26 Jun 99)
ATO-K	Fly K	Current	(25 Jun 99)
ATO-J	Assess (BDA)		

Legend:

BCD = Battlefield Coordination Detachment
BDA = Battle Damage Assessment
CTL = Candidate Target List
JIPTL = Joint Integrated Prioritized Target List

Figure 5: ATO Decision Briefing

Colonel Mark A. Graham took command of the 40th Infantry Division (Mechanized) Artillery, California Army National Guard (ARNG), in September of 1998 as the first Active Component (AC) officer to command an ARNG brigade-level unit in peacetime. In his previous assignment, he was the Chief of the Field Artillery Branch in the US Army Personnel Command, Alexandria, Virginia. He also commanded the 1st Battalion, 17th Field Artillery, part of the 75th Field Artillery Brigade, III Corps Artillery at Fort Sill, Oklahoma. Among other assignments, he served as S3 of the 1st Armored Division Artillery and S3 of the 2d Battalion, 29th Field Artillery in the 1st Armored Division, both in Germany; and as the G1 for VII Corps Artillery, deployed to Saudi Arabia during Operations Desert Shield and Storm. He commanded two batteries: one in the Field Artillery School Brigade and one in III Corps Artillery.

Lieutenant Colonel Chris A. Hood is the 40th Infantry Division Artillery Deputy Fire Support Coordinator (DFSCOORD), California ARNG. In previous assignments, he commanded the 2d Battalion, 144th Field Artillery and three batteries in both the California and Ohio National Guards. While on active duty, he was a Battalion Fire Support Officer and Special Weapons Officer for the 1st Battalion, 20th Field Artillery, 4th Infantry Division (Mechanized) at Fort Carson, Colorado. He also served in various positions with the 1st Battalion, 333d Field Artillery (Lance) in the 42d Field Artillery Group in Germany. He holds a Master of Arts with a concentration in Human Resource Management from the University of Utah. When Lieutenant Colonel Hood is not serving as DFSCOORD, he is Telecommunications Sales Representative in Phoenix, Arizona.

Major M. Robert Bettencourt III is the Assistant S3 for the 40th Infantry Division Artillery, California ARNG. He previously served as the Deep Fires Coordinator in the 40th Division's Operational Fires Element during exercise Roving Sands 99 at Fort Hood, Texas. He was the 3d Brigade Fire Support Officer and Battery Commander of B Battery, 1st Battalion, 143d Field Artillery, all with the California ARNG. Major Bettencourt's civilian occupation is as an attorney in Visalia, California. He holds a Juris Doctor from McGeorge School of Law in Sacramento, California.

Pharaoh's Battery

The 3d Battalion, 116th Field Artillery (Multiple-Launch Rocket System), Florida Army National Guard (FLARNG), recently participated in a Battalion/Brigade Battle Staff (BBS) exchange program with the Egyptian Army. During the 3-116th's annual training in July, six Egyptian FA officers observed training and support techniques of our battalion. In August, six US FA officers visited the Egyptian Field Artillery. The following are some of our observations.

The Egyptian Army's 122-mm self-propelled gun is a combination of the Russian-designed, Egyptian-built 122-mm D-30 towed howitzer and our M109 chassis/drive train.

Equipment. We were surprised to find the Egyptians use the AN/TPQ-37 Firefinder radar, M109A2 howitzers and M981 fire support team vehicles (FIST-Vs) and how competent they were with these systems. The Egyptian Army also developed a 122-mm self-propelled gun, which is a combination of the Russian-designed, Egyptian-built 122-mm D-30 towed howitzer using our M109 chassis/drive train.

The Egyptians use Russian plotting boards and aiming circles calibrated in the "DC" system for observation (360 degrees equals 6,000 DC), but they use American M2 aiming circles calibrated in mils (360 degrees equals 6,400 mils) to lay the battery. The battery we visited had four M109A2s, one M113 armored personnel carrier (APC) for the battery commander and forward observers (FOs), one M992 FA ammunition support vehicle (FAASV), two locally produced two-and-one-half ton wheeled trucks for wire communications and maintenance, and one M992 FAASV configured as a fire direction center (FDC). The FAASV is infinitely superior to the M577 as an FDC. It has more room for maps, charts, radios and personnel.

The Egyptians developed a laptop computer running locally designed user-friendly fire direction software that serves as their battery computer system (BCS). The computer lacks a radio frequency modem, so fire commands are still done by voice. Also, it can't exchange data with higher headquarters/adjacent units or receive battlefield geometry or computer meteorological data. The Egyptians use programmable calculators that function similarly to our backup computer system (BUCS). Their radios are our AN/PRC-25/77 and AN/VRC-46/47 radios.

The FOs had the civilian night-vision scope (NVS) 900 and the US Marine Corps AN/GVS-5 laser rangefinder. Both are mounted on Russian tripods calibrated in the DC measurement system. The Egyptian battery equipment reflects this mix of western and Russian equipment and off-the-shelf hardware.

Technical Computations. The FDC we saw had a chart posted with the charges and quadrant elevations for achieving standard ranges. It had no BCS, graphical firing tables or methods for computing Met data. The brigade has an Egyptian version of our position and azimuth determining system (PADS) for survey and European instruments for calculating Met conditions. I did not see where in the process the correction for standard conditions entered computations.

The Egyptians consider artillery to be an area-fire weapon and the desert to be a big area. That is, they sacrifice some accuracy to get improved response times. To do this, they fire four-round abbreviated registrations immediately after occupation. This allows them to get steel on target quickly while compensating for non-standard conditions without a lot of manual computations and corrections. The drawback is that it's only effective for approximately two square kilometers around the registration point. Also, this type of registration can't be transferred to adjacent units.

However, it seems to work. In the desert, Met conditions change slowly, if at all, and in the large flat desert, unobserved rounds don't happen often. The system they use is fairly accurate and very responsive.

The greatest possibility for introducing error into the system appears to be observers' working in one measurement system (DC) and the gunline in another (mils). It encourages technical mistakes from having to constantly convert between the two—a potential for mistakes that can be exacerbated by fatigue and stress. But the Egyptians seem to be quiet adept at calculating the conversions quickly.

They also have developed an interesting method of controlling fires in the featureless desert without using a map or knowing the unit's location. The observer takes a blank firing chart and plots himself in the center. The howitzer fires a round at a point in front of the observation point (OP), and the FO measures the direction and distance to burst. The howitzer checks the range it fired and the azimuth of fire and sends this information to the OP.

The battery commander at the OP plots the howitzer on the back azimuth and distance from the burst. He then has a chart with the battery and OP plotted relative to the impact. The battery commander has the FDC number the grid lines on the map with numbers he designates, creating a crudely surveyed firing chart.

I was amazed at the simplicity and accuracy of this system. That it works so well is probably due to the unobstructed 360-degree view the desert affords the observer from most OPs.

Observed Fire. The Egyptian battery commander goes forward of his unit with the observers and sets up two OPs. The primary OP consists of the battery commander, two FOs and two radio-telephone operators (RTOs).

The secondary OP is about 300 to 700 meters on the flank of the primary OP. It has one observer, one RTO and an aiming circle. The two OPs triangulate the location of targets on the battlefield. There is no "fire support team" as we know it; the battery commander coordinates with the supported unit from the OP. The system works well and results in exceptionally accurate target locations.

The Egyptians do not use global positioning systems (GPS)dependent on foreign satellites or any other hardware or systems not under their control. They take great pride in being self-sufficient in the operation and repair of their equipment.

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Operations Officer, 3-116 FA,
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Digital Interoperability Between AFATDS and IFSAS

by Major Michael A. Ascura, AC

Some units have had problems getting the advanced FA tactical data system (AFATDS) and the initial fire support automation system (IFSAS) to talk digitally. For example, the 3d Infantry Division (Mechanized) Artillery had problems in Kuwait, as discussed in part of the article "Operation Desert Thunder and the Force FA Headquarters" by authors Major Thomas I. Eisiminger, Jr., Lieutenant Colonel James M. Waring and Colonel John A. Yingling that appeared in the January-February 1999 edition.

The following briefly outlines tactics, techniques and procedures (TTP) for digital message traffic between AFATDS-IFSAS. Units can find more comprehensive TTP in the AFATDS-IFSAS standing operating procedures (SOP) on the Training and Doctrine Command (TRADOC) System Manager for FATDS web page at http://sill-www.army.mil/TNGCMD/TSMAFATDS.

Architecture. The correct configuration for the two systems is to use AFATDS as the higher command, control and communications (C^3) system and IFSAS as the subordinate C^3 system. The architectural systems setup for AFATDS is listed in Appendix J, *Special Text 6-3++ Advanced Field Artillery Tactical Data System: Tactics, Techniques and Procedures* and is available on the TSM-FATDS web page.

Software. IFSAS uses "packaged" software that allows AFATDS to digitally communicate with not just IFSAS, but also other fire support legacy systems, including the battery computer system (BCS), fire direction system (FDS), light tactical fire direction system (LTACFIRE) and Firefinder radars (Q-36 and Q-37).

The current version of AFATDS software is AFATDS 97. Both AFATDS 97 and Package 10 support the messages essential to execute fire support missions (listed in the figure). As shown in the figure, not all messages are exchangeable between the two systems.

The system's digital interoperability is expanding to include 55 messages with the fielding of AFATDS 98 and Package 11 software. The interoperability notes for AFATDS 98 to Package 11 devices are listed on the TSM-FATDS web site.

Every 15 to 18 months, units receive a new version of AFATDS and package software. By the end of FY 2000, AFATDS units will have AFATDS 98 and those being fielded will receive the system with AFATDS 98. IFSAS units will receive Package 11 via a fielding team visit to train them on the differences between the old and new software by the end of FY 2000.

Message	AFATDS Sends to IFSAS	AFATDS Accepts from IFSAS
SPRT.BGEOM	Yes	Yes
SPRT.DATUM	Yes	No
SPRT.MAP	Yes	No
SPRT.SCPST	Yes	Yes
SPRT.TPAC	Yes	Yes
SPRT.ZONE	Yes	Yes
AFU.AMOL	Yes	Yes
AFU.UPDATE	No	Yes
AFU.ASR	No	Yes
AFU.OPSTAT	No	Yes
AFU.POSTUR	No	Yes
AFU.SR	No	Yes
FM.OBCO	Yes	Yes
AFU.AMMO	Yes	Yes
AFU.AMSS	Yes	Yes
AFU.MFR	Yes	Yes
FM.CFF	Yes	Yes
FM.FOCMD	Yes	Yes
FM.MTO	Yes	Yes
FM.QF	Yes	Yes
FM.SUBS	Yes	Yes
FM.THMTGT	Yes	Yes

Message	AFATDS Sends to IFSAS	AFATDS Accepts from IFSAS
NNFP.FASCAM	No	Yes
NNFP.FPTU	Yes	Yes
NNFP.MOD	Yes	No
NNFP.XSCD	Yes	Yes
NNFP.XTGT	Yes	Yes
ATI.AZR	No	Yes
ATI.CBTI	Yes	Yes
ATI.CDR	Yes	No
ATI.SHR	No	Yes
FSE.NBC1NU	Yes	Yes
MET.CFL	Yes	No
MET.COM	Yes	No
MET.CM	Yes	No
MET.CW	No	Yes
MET.TA	Yes	No
SPRT.AMODAT	Yes	Yes
SPRT.EFFDAT	Yes	Yes
SPRT.RNGEFF	Yes	Yes
SPRT.TEDE	Yes	No
SYS.PTM	Yes	Yes
SYS.SBT	No	Yes

Fire Support Messages. This table lists the essential messages needed to execute fire support missions and their digital compatibility from AFATDS to IFSAS and vice versa in AFATDS 97/98 and IFSAS Package 10 software.

System Setup. IFSAS operators must make AFATDS legal for all message types. This function allows the exchange of various message types with AFATDS. Appendix J lists the message types common to AFATDS and IFSAS and the known problems between the two systems when exchanging digital messages.

Communications. IFSAS does not support an AFATDS device type in its subscriber information. To put an AFATDS unit in the IFSAS communication tables, the device type must be entered as "computer." With this device type, IFSAS "thinks" it is talking to another IFSAS and will process messages to AFATDS. If another device besides "computer" is used, sending messages to AFATDS could result in a failed transmission.

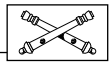
System Classification. Both IFSAS and AFATDS must be set to operate on the same system classification. However, if both AFATDS and IFSAS are operating in the unclassified mode, IFSAS still must unclassify each message before sending it to AFATDS. Failure to unclassify an IFSAS message will result in a "communications alert" message in AFATDS.

Map Mod. To correctly exchange grid coordinate information associated with targets and geometry between AFATDS and IFSAS, both systems must operate on a common map mod. Because AFATDS is the higher C^3 system, the operator follows specific procedures: select "Messages and Alerts" from the tool bar menu and then select "Messages," "New," "SPRT Map" and "OK." This opens an SPRT map window in AFATDS with the map mod already filled in. Then by selecting "Options," the operator can send the map mod to IFSAS.

Training. Units to be fielded AFATDS will receive AFATDS-legacy fire support system interoperability training, (including IFSAS, as relevant) during new equipment training (NET). They will conduct a command post exercise (CPX) to establish and test digital interoperability between AFATDS and its legacy systems. Also, IFSAS operators receive brief instructions on how to set up AFATDS as a digital device in IFSAS.

Conclusion. Appendix J is a valuable reference for establishing digital interoperability between AFATDS and IFSAS. The appendix not only lists message interoperability, but also describes common procedures for processing fire missions. Units can use the appendix to develop SOPs for establishing AFATDS-IFSAS digital traffic.

The TSM-FATDS at the FA School stands ready to help units with any of their AFATDS challenges; call DSN 639-6838 or 6839 or commercial (580) 442-6838 or 6839.



Major Michael A. Ascura, Acquisition Corps, until recently was the Advanced Field Artillery Tactical Data System (AFATDS) Hardware Testing and Fielding Manager for the Training and Doctrine Command (TRADOC) System Manager for FATDS (TSM-FATDS), Fort Sill, Oklahoma. Currently, he is a Test Officer in the Operational Test Command at Fort Hood Texas. In his previous assignment, he commanded C Battery, 2d Battalion, 80th Field Artillery in the Field Artillery Training Center at Fort Sill. Among other assignments, he served as Chief of the Operations Cell at the Joint Readiness Training Center, Fort Polk, Louisiana, and Assistant S3 for the 4th Battalion, 82d Field Artillery of the 42d Field Artillery Brigade, also at Fort Polk. Major Ascura is a graduate of the Materiel Acquisition Management Course, Fort Lee, Virginia, and the AFATDS Command and Staff and AFATDS Operator's Courses, both at Fort Sill.

ICDB Number for **SATCOM** Access

ICDB stands for integrated communications database and is very important for warfighting com manders from the company to the corps levels who need to communicate via military satellite communications (MILSATCOM). Every Army unit, Navy ship, Air Force squadron or Marine task force needs an ICDB number to access MILSATCOM resources.

The ICDB is a consolidated repository of more than 3,500 validated Department of Defense MILSATCOM requirements. The database is managed by the Joint Command, Control, Communications, Computer and Intelligence (C^4I) Decision Support Center (JCDSC) at the Defense Information Systems Agency (DISA), Washington, DC. The ICDB documents current as well as future requirements.

The ICDB has been around since 1975 and may be known by several other names. In 1991, it was called the user requirements database (URDB) when it merged with the Air Force's database containing Milstar satellite requirements. This database was called the integrated satellite database (ISDB), which later merged with a database containing terrestrial communications requirements to become the ICDB.

Members of the 51st, 52d and 54th Combat Communications Squadrons, Robins AFB, Georgia, set up a 20-inch Quick-Reaction satellite antenna in support of Operation Southern Watch. *(Photo by SSG Efrain Gonzalez, 1st Combat Camera Squadron)*

ICDB Number Validation and Approval Process. An ICDB number is *mandatory* to compete for access to MILSATCOM resources. To get the number, a unit first establishes a validated requirement. The requirement is based on warfighting operations, force structure and equipment to support the warfighting requirement. The unit submits DISA Form 772 through its chain of command to the Commander-in-Chief (CINC) who would be supported with the requirement. (To save processing time, the unit must be sure it answers the questions listed in the figure when filling out Form 772.)

The CINC's J3 reviews and validates the requirement and forwards it to the J6. The J6 then submits the requirement to the Joint SATCOM Panel Administrator (JSPA) in DISA. After the validated requirement arrives at the JSPA, the approval process takes about six weeks. Once approved, the unit receives a number assigned to that specific requirement.

The process is described in detail in the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6250.01,20, October 1998: www.dtic.mil/doctrine/jel/cjcsd.htm. Once the number is assigned, it must be revalidated every two years.

- Is the SATCOM requirement valid?
- Does our requirement have a clear operational concept?
- Is our requirement supported by operations plans (OPLANs) or operations orders (OPORDs) that are clearly identified?
- Does our requirement identify the mission supported?
- Do we clearly spell out what will happen and the mission impact if the request is disapproved?
- Is a current point of contact listed with accurate information?

To speed the ICDB number approval process, the unit should answer these questions in its initial submission of DISA Form 772.

There will be times when missions call for fast responses and six weeks is too long to wait for approval. Urgent requirements can be submitted directly to the Joint Staff/J6 with information copies to the JSPA.

ICDB Updates. Once the unit receives its ICDB number, it must update the information in the database every two years in the odd numbered years. The purpose is to make sure all SATCOM requirements are current and accurately stated in the ICDB.

Also, it's critical the commander with a validated requirement conduct periodic "maintenance" checks to ensure his requirement remains in the ICDB. Information may change, such as points of contact; concepts may need to be revised; or terminal numbers may need to be modified. Getting approval for the requirement is not difficult, but ignoring update procedures could cause the unit to lose its number.

Units should remember that an ICDB number does not *guarantee* satellite access—it's only the "ticket" to compete for access based on availability of resources and priority of need.

A commander, operations sergeant or other warfighter who "owns" satellite equipment and is responsible for establishing communications via SATCOM should find out if his unit's validated requirement is in the ICDB and what the number is. To get this information, the unit goes through its chain of command to the major command J6. Mission accomplishment or training exercise success may depend on his five-digit ICDB number.

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DOCC Operations in JTF-Kuwait

by Major Roy C. Sevalia and
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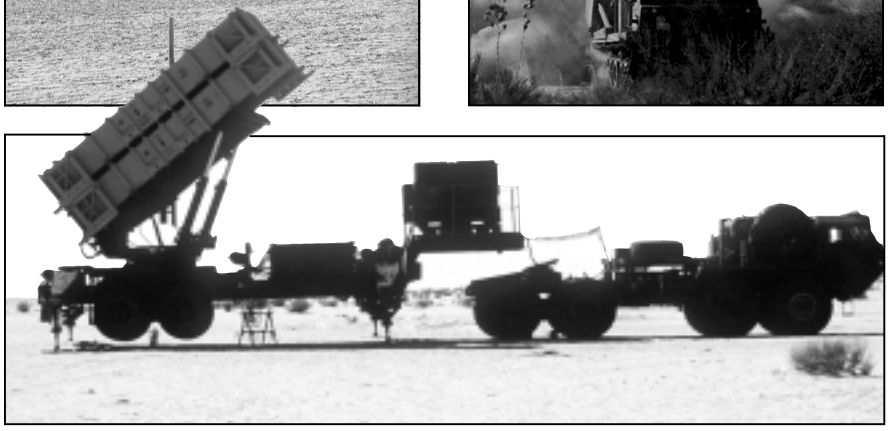
Deep fires at the coalition/joint task force level is the collective and coordinated use of indirect fire, armed aircraft and other lethal and non-lethal means in support of the joint force commander's (JFC's) battle plan that gives him the competitive edge to dominate the air, land and sea. Joint fires operations extend throughout the theater and vertically into space and include effects from any service component in coordinated actions to fulfill the joint commander's priorities and his concept of operations.



F-16 Falcon, Apache Helicopters, Patriot Air Defense Missile and ATACMS

Synchronization of joint fires requires the integrated, simultaneous activities of intelligence, air operations, ground operations, maritime operations and logistics in time and space. Targets include not only fielded enemy units, but also enemy centers of gravity, such as his leadership; infrastructure and key production components for transportation, energy and command, control, communications and intelligence (C^4I); nuclear, biological and chemical capabilities; theater ballistic missiles; war-making industries and the population via non-lethal means. Successful joint fires produce immediate and long-term effects on the enemy's capability and will to prosecute the war.

This article describes how the US Central Command (USCENTCOM) plans and executes joint fires from its forward deployed Coalition/Joint Task Force-Kuwait (C/JTF-Kuwait). The task force is established when the commander of Third US Army/US Army Forces Central Command (ARCENT) is forward deployed in support of the commander-in-chief CENTCOM (CINCCENTCOM). The discussion includes the "job description," organization and procedures of the joint force land component command's (JFLCC's) deep operations coordination cell (DOCC).

Although C/JTF-Kuwait was also a coalition headquarters, this article focuses on US joint fires at the operational level. As such, C/JTF-Kuwait is referred to as JTF-Kuwait for purposes of this article. These US joint operations are the basic operations into which the coalition forces are integrated to contribute to deep operations.

Overview: Battlefield Command and Framework

The CINCCENTCOM normally will be JFC for operations that involve US Army Forces Central Command (USARCENT). (ARCENT is CENTCOM's equivalent to an army force, called ARFOR.)

In theater-level operations, the CINCCENTCOM typically establishes functional component commanders. Under most circumstances, the commander of USARCENT also is designated the JFLCC in the CENTCOM area of responsibility (AOR).

JFLCC responsibilities include the employment of land forces in theater, organization for combat, priority of the main effort and designation of fire support coordination measures (FSCMs), boundaries and a phased ground scheme of maneuver to support the campaign or operation.

However, as the JFC, the CINCCENTCOM retains approval authority for joint force employment, orders and graphical control measures to ensure unity of effort and integrate and synchronize combat assets.

The JFLCC employs a battlefield framework that establishes operational responsibilities for subordinate commanders and provides a way to visualize how they will employ their forces against the enemy—especially critical for the deep battle. The primary tool he uses to establish the deep operations battlefield framework is the fire support coordination line (FSCL). He organizes the battlefield in such a manner as to provide enough time and space for his major subordinate commands (MSCs) to conduct their own fights.

Delineation of responsibilities focuses unit AORs and is based on mission, enemy, terrain, troops and time available (METT-T). Delineation does *not* prevent a unit from nominating targets outside its area for inclusion in the joint integrated priority target list (JIPTL) and air tasking order (ATO).

The JFLCC commander delineates targeting responsibilities using one or a combination of methods: battlefield geometry, enemy force responsibilities and timeframes.

Battlefield Geometry. The JFLCC commander may use a control measure, such as the FSCL, to delineate responsibilities. The MSCs conduct targeting short of the control measure, while the JFLCC conducts targeting beyond the control measure to the forward boundary of the joint operations area. Each MSC conducts deep operations from the forward line of own troops (FLOT) out to the FSCL with its organic attack systems, but it may nominate targets beyond the FSCL for attack with air interdiction (AI) assets. The JFLCC can nominate targets outside of its area of responsibility through the ATO planning process.

Enemy Forces. The JFLCC commander may designate enemy formations as the targeting responsibilities of particular MSCs. This may be used in conjunction with geographical or event limits or triggers. For example, "X Corps is responsible for the 1st OPFOR [opposing force] Army south of Running River."

Timeframe. The JFLCC commander can designate times for an MSC's targeting responsibilities. For example, he could designate his corps plan and fight forces that will impact the JTF 24 to 72 hours out while the JTF covers forces whose effects are more than 72 hours out.

Joint Fires Synchronization: The DOCC

The JFC normally designates the JFLCC as the supported commander for surface operations in the area between the JFLCC's rear and its forward boundaries. The JFLCC accomplishes his joint fires tasks listed in Figure 1 via the DOCC.

The DOCC's mission is to apply operational fires (lethal and non-lethal) in accordance with the commander's guidance to create the conditions for success on the battlefield. The DOCC must accomplish three tasks while planning, synchronizing and executing deep operations to achieve the commander's intent. First, the DOCC facilitates maneuver in depth by suppressing the enemy's deep strike systems, disrupting the enemy's operational maneuver and tempo and creating exploitable gaps in enemy positions. Second, it must isolate the battlefield by interdicting enemy military potential before it can be used effectively against friendly forces. And third, the DOCC is to destroy critical enemy functions and facilities that eliminate or substantially degrade enemy operational capabilities.

The ARFOR G3 is the executive agent for deep operations. All other ARFOR staff sections are responsible for coordinating deep operations actions with the G3. The DOCC is part of the ARFOR's G3 shop.

The DOCC coordinates targeting guidance and objectives, develops a candidate target list (CTL) for integration with the ATO and monitors ATO execution and FSCMs. It is divided into five branches: the deep operations branch, consisting of the plans, target development and operations sections; the electronic warfare (EW) branch; the command and control warfare (C^2W) branch; the psychological operations (PSYOP) branch; and the fire support element (FSE).

Deep Operations Branch. The first of the five is the deep operations branch (operational fires).

Plans Section. This section plans the deliberate targeting process. It begins

- Plan and execute ground operations within his assigned area of operations to support the commander-in-chief's (CINC's) campaign plan.
- Consolidate, deconflict, prioritize and nominate targets for joint fires to the coalition/joint force air component commander (CJFACC) for inclusion in the joint integrated prioritized target list (JIPTL) and the air tasking order (ATO).
- Coordinate planned organic fires between the fire support coordination line (FSCL) and the land component command's (LCC's) forward boundary.
- Submit requests for immediate air support against time-sensitive targets (TSTs) and high-payoff targets (HPTs) to the battlefield coordination detachment (BCD) operations officer in the air operations center (AOC).
- Establish LCC fire support coordinating measures (FSCMs) and boundaries; coordinate FSCMs with CJFACC via the BCD.
- Provide combat assessment relative to the accomplishment of the coalition/joint force command (CJFC) directed or component-derived objectives to the CJFC and other components on enemy ground activity and future intent.
- Provide mobile target nominations via the BCD to the CJFACC's mobile target working group.

Figure 1: Deep Operations Coordination Cell (DOCC) Tasks

1. Delay 2d OEF by xx hours. D-D+6	On ATO	Attacked	BDA*				Assessment**
			D	DMG	MD	LD	
1A. MOB/CM, Destroy RR & Road Network NE Section of Country (2 Junction/Switch Yards), MOB Eng Assets & Key Choke Points (Bridges) Unusable	63	63	15	1	6	11	A
Destroy 50% of HETs (Sets)	2	2				2	A
Rail Network	8	8	1			3	G
Highway Bridges	49	49	14		5	6	A
Engineer Assets (Sets)	3	3		1	1		A
1B. C³I. Destroy Nodes, Brigade and Above	10	8	5	5			G

Legend:

ATO = Air Tasking Order
BDA = Battle Damage Assessment
C³I = Command, Control, Communications and Intelligence
OEF = Operational Echelon Force

***D =** Destroyed
DMG = Damaged
MD = Moderately Damaged
LD = Lightly Damaged

**G = Mission Accomplished
A = Partial Success
R = Minimum Success
◯ = No Assessment

Figure 2: Sample Combat Assessment of "Delay Second Operational Echelon Force" for ATO G

by participating in the future plans (96 hours and beyond) and future operations (24 to 96 hours) operational planning groups.

The plans staff initiates the Decide phase of the Decide, Detect, Deliver and Assess (D³A) targeting methodology during the planning process. In conjunction with G2/G3 planners, the DOCC plans section conducts high-value target (HVT) and high-payoff target (HPT) analysis and develops draft targeting guidance and objectives.

The plans section continues refining the recommended objectives and conducts detailed staff planning during its daily target guidance working group (TGWG). Additionally, the TGWG considers future FSCL placement and other FSCMs, as needed.

The plans section presents the results of this battle staff synchronization to the JFLCC's deputy commanding general (DCG) during the daily targeting board (DTB). The DTB provides an opportunity for the DCG, staff and components to synchronize and deconflict operational fires.

The DTB is the forum used by the JFLCC to obtain approval of the 72-hour targeting guidance and objectives and receive additional guidance for the 96-hour planning period. It also provides the subordinate MSCs specific guidance for joint fires and targeting.

The DTB prepares the JFLCC DCG for the JFC's joint coordination board (JCB). This ensures the DCG has visibility on the JFC's concept of joint fires, ensuring joint synchronization from the JFLCC perspective. The DTB presentation is tied in detail to the ATO cycle, the estimated enemy and friendly situations, the concept of fires and the recommended targeting guidance and objectives.

Before the 72-hour targeting guidance is presented, the DOCC chief reviews the current combat assessment against standing targeting objectives (see the example in Figure 2). This sets the stage for the 72-hour targeting concept and recommended guidance and objectives.

Also, the staff weather officer displays the effects of weather on friendly and enemy actions for future ATO periods. This presentation focuses on joint fires resources and specific weather effects. Figure 3 is an example of the staff weather officer's input to the DTB.

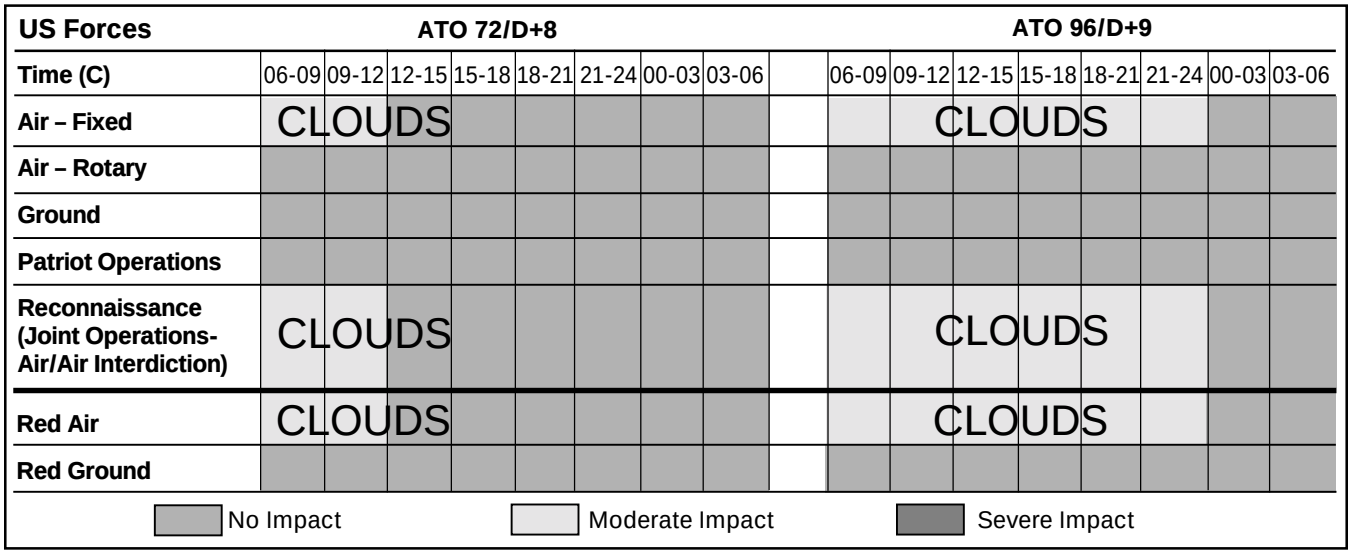


Figure 3: Weather Impact on Joint Operations-Air (JOA)

The G2 and G3 planners lead the main portion of the DTB briefing with the estimated enemy and friendly situations (72 hours out). The briefing includes estimated enemy courses of action (COAs) and planned friendly force arrays. Additionally, any planned FSCMs are presented in relationship to time and battlefield geometry. Most importantly, this includes the anticipated location of the FSCL and any possible movements or shifts during the ATO period.

Once the baseline information is presented, the details of the targeting effort are displayed through a concept of fires paragraph and by identifying targeting objectives synchronized with the enemy situation and friendly concept of operations (see the example in Figure 4).

The targeting guidance and objectives are finally captured in a single slide known as the battlespace shaping matrix (BSM). This product becomes the source tool for the remainder of the targeting effort, to include execution. The BSM articulates the targeting objectives in priority, the target sets in support of each objective and the HPTs for each target set (see Figure 5). The BSM also provides time-sensitive target priorities and attack guidance as well as "kill box" priorities beyond the FSCL.

The final check and balance of staff synchronization regarding competition for limited resources occurs when the collection manager (CM) displays the collection asset programming slides. These slides demonstrate the collection systems' nesting with the targeting objectives and the coverage provided during the ATO period.

Once the targeting guidance is approved, the plans section disseminates the JFLCC targeting guidance to the battlefield coordination detachment (BCD) plans section to ensure the JFLCC commander's guidance and intent are accurately represented at the joint force air component command's (JFACC's) joint air operations center (JAOC). This occurs during the daily joint guidance and apportionment targeting (JGAT) meeting.

Target Development Section (TDS). The TDS is the focal point for deep operations target nominations. After receiving the commander's targeting guidance, the TDS coordinates with subordinate land component units for joint fires target nominations and develops a consolidated CTL. This list includes all the JFLCC's nominations to the JFACC for integration into the ATO.

The TDS reviews each target nomination and history to ensure every target meets the JFLCC commander's targeting guidance. Individual targets are plotted using the global command and control system-Army (GCCS-A) to avoid duplication.

Digital is the primary communications mode for subordinate units to submit target nominations to the DOCC. The advanced FA tactical data system (AFATDS) is the principal means by which Army corps and the US Marine units pass target nominations to the DOCC. AFATDS has some limited interface capabilities with other systems, such as the Air Force's contingency theater automated planning system (CTAPS).

CTAPS contains several modules that can help the targeting process. The primary CTAPS module used for target nominations in the JFC's AOR is the rapid application of air power (RAAP). RAAP is a target development tool that receives externally generated intelligence data; helps target nomination and validation; accesses local target, threat and order of battle databases; and integrates high-level knowledge of enemy operations and intelligence with current and historical data.

The DOCC uses RAAP to collect and prioritize target nominations and create the CTL. Currently, RAAP works within the CTAPS common operating environment, but the newer versions will be able to operate in a "stand-alone" configuration outside the CTAPS environment.

After the TDS consolidates and prioritizes the proposed CTL, the staff judge advocate (SJA) representative within the DOCC reviews it. The SJA rep is responsible for conducting rules of engagement (ROE) and law-of-war legal reviews of all targets nominated on the CTL. For the legal review, he uses Tarcheck, a DOS-based program that provides a list of key facilities (collateral) within a two- to four-kilometer radius of the nominated target.

With this information, the SJA representative makes recommendations to the DOCC chief as to whether or not to strike a nominated target. If there is a great potential for collateral damage and the target maintains its military necessity, a recommendation to use precision-guided munitions or another method of engagement to mitigate collateral effects may be included on the CTL for that specific target request.

Finally, the TDS briefs the DOCC chief during the CTL review board for approval of the CTL before forwarding it to the BCD. The BCD is the JFLCC's representative at the JAOC that advocates to the JFACC the CTL for inclusion in the ATO. This review board highlights each target category related to targeting objectives and verbally and graphically summarizes the consolidated CTL.

Operations Section. This section is responsible for battle management of ATOs that are 48 and 24 hours out from execution. This includes monitoring the development of the ATO and other deep operations planned and coordinating the complementary actions required to support the JFLCC's guidance and intent.

The routine functions and actions performed by the operations section are to synchronize current operations with future operations. The operations section recommends changes to approved targeting guidance for the next 24 to 48 hours as well as changes to planned FSCMs due to unanticipated enemy actions. The section reviews the incoming ATO against the CTL submitted by the TDS, using the ATO list and the non-supported target list received from the JFACC. (Non-supported targets are those submitted by the BCD that are not on the next ATO.)Targets not resourced are recommended for inclusion on a later ATO.

Other operations section functions: prepare the AI divert list for targeting guidance changes (24- to 48-hour time period); integrate theater missile defense (TMD) attack operations with deep battle operations; receive and parse the ATO and conduct ATO hand-over briefings with the FSE; receive feedback from the BCD on JFLCC AI nomina-

Complete destruction of the second operational echelon force (OEF); priority of effort to #1 and #2 divisions in order.

- ***Maneuver:*** destroy maneuver brigades of enemy division; priority to armored, then mechanized units.
- ***Fire Support:*** destroy all artillery, destroy reconnaissance, surveillance and target acquisition (RSTA).

Figure 4: Target Objectives for ATO 72/D+8

	Target Objective 1 Complete Destruction of 2d OEF (XXX)		**Target Objective 2** Disrupt Offensive Spt/Prevent Withdrawal		**Target Objectives 3** Influence Actions		**Target Objective 4** Destroy Enemy's Ability to Deliver WMD		**TSTs****
Unit	Units; #1, #2 in Order		Committed Forces		Un-Committed Forces				TLE: 200 m/100 m S: Scud Launcher A: Stationary T: 20 Minutes P: Al, ATACMS
Time	On Order		D+6 to O/O		D+7 to O/O		D-Day to D+45		
Pri	**Cat**	**HPTs**	**Cat**	**HPTs**	**Cat**	**HPTs**	**Cat**	**HPTs**	
A	Man	T-72 (D*) BMP (D)	CSS	Class III Vehicles (D) Class V Vehicles (D) Resupply Points (D) MSRs (N)	Mil	Corp/DiV Leaders	FS	Scud (D) RSTA (D) Frog (D)	TLE: 200 m/100 m S: Missile System A: Stationary T: 20 Minutes P: Al, ATACMS
B	FS	MRL (D) RSTA (D)	C^3I	NCA (N) Corps CPS (D)	Insg	Leaders Members	C^3I	Fiber Optic Comm Links (D)	TLE: 200 m/100 m S: MRL A: Stationary T: 20 Minutes P: Al, ATACMS
C			M/CM	HETs (D) Rail Networks (N) Key Bridges (N)	Civ	General Populace	CSS	Ammunition (D) Maintenance (D) Storage (D)	TLE: 2 km/100 m S: HELOS 10+ A: Stationary T: 1 Hour P: Al, ATACMS
D									TLE: 2 km S: Armor Battalion + A: Stationary T: 1 Hour P: Al
E									TLE: 1 km/100 m S: FOB A: Stationary T: 1 Hour P: Al, ATACMS

Killbox Priorities: AB1, AB2, AB3, AB4/Man (AR, Mech), FS, CSS

***Desired Effects:** Neutralize (N) Attrit (A) Destroy (D)

****TLE =** Target Location Error (Accuracy of Sensor) **S:** Size of Target **A:** Activity of Target **T:** Time of Acquisition **P:** Attack System Priority

Legend:

AI = Air Interdiction
ATACMS = Army Tactical Missile System
C^3I = Command, Control, Communications and Intelligence
Cat = Category
Civ = Civilian
CSS = Combat Service Support
Corps CPs = Corps Command Posts
FOB = Forward Operating Base
FS = Fire Support
HETs = Heavy Equipment Transporters
Insg = Insurgents
Man = Maneuver
M/CM = Mobility/Countermobility
Mil = Military
MRL = Multiple Rocket Launcher
MSRs = Main Supply Routes
NCA = National Command Authority
OEF = Operational Echelon Force
O/O = On Order
Pri = Priority
RSTA = Reconnaissance, Surveillance and Target Acquisition
TSTs = Time-Sensitive Targets
WMD = Weapons of Mass Destruction

Figure 5: Battlespace Shaping Matrix (BSM)—Phase XX of ATO 72/D+8 (Example)

tions submitted to the JFACC; assess the commander's guidance and objectives through the combat assessment board; and develop operational fires fragmentary orders (FRAGOs).

The operations section manages a variety of multi-echelon, multi-service systems to ensure the DOCC is integrated with the JFC's joint-targeting cycle. AFATDS builds and passes battlefield geometry, enters FSCMs and monitors subordinate unit status. CTAPS receives and parses the ATO and any other JAOC products, such as the air control order (ACO). Targets submitted by the MSCs that made the ATO are then transmitted using AFATDS. Finally, the GCCS-A receives the common operating picture to monitor the current friendly and enemy situations.

Fire Support Element. The FSE serves as the current operations section of the DOCC. It is located in the JFLCC operations and intelligence (O&I) section where it interfaces with the G2, G3 and other staff sections and agencies. This positioning allows the FSE to advise the battle captain on the use of operational fires resources.

Target management is the most important function the FSE performs. This is the process of monitoring the execution of the current ATO and other deep attack missions planned. The FSE monitors the execution of JFLCC targets for each ATO cycle by reviewing air mission results through mission reports (MISREPS) and pilot reports (PIREPS) on CTAPS. Additionally, the FSE uses AFATDS to monitor indirect fire activities.

Based on the current situation and with the battle captain's approval, the FSE coordinates "diverts" (re-directing airborne aircraft from striking one target to strike another higher priority target) and "re-roles" (changing the mission of airborne aircraft—close air support, AI,

etc.—to attack a new set of targets). These actions are coordinated through the BCD operations cell to the JFACC for approval. In line with these actions, the FSE also serves as the adjudicator of close air support allocations for subordinate ground forces. This involves shifting assets as necessary to support the different MSC fights.

Attack of time-sensitive targets is an FSE function. The FSE establishes quick-fire links via digital means (AFATDS) and voice means (mobile subscriber equipment, or MSE). These links are connected to various sensors and shooters in theater, such as the Army's Air Missile Defense Command, force FA (FFA) headquarters and BCD. The choice of the weapon to attack a time-sensitive target is driven by the asset that can service it in the most expedient manner, usually aircraft or the Army tactical missile system (ATACMS).

The FSE recommends FSCMs to facilitate the use of fires in support of the JFLCC. The FSCL is the predominant control measure recommended by the FSE. In close coordination with the battle captain, the FSE monitors the positioning of the FSCL to ensure it facilitates the current fight. If changes are deemed necessary, they must be identified a minimum of six hours out to allow for dissemination to all units operating in the theater.

This control measure serves as the line of coordination for engaging targets in the joint operations area. The MSCs generally fire targets short of the FSCL while the JFLCC's DOCC focuses on targets beyond in an effort to shape the battlefield for future operations. During the offense, the FSCL is generally placed further forward of the FLOT to facilitate rapid advance of ground forces with minimal coordination. In the defense, the FSCL is generally placed closer to the FLOT to allow the JFACC maximum opportunity to employ air power with minimal coordination.

C^2 Warfare Branch. This branch plans, coordinates and executes information operations (IO): physical destruction, operations' security (OPSEC), EW, deception, PSYOP, public affairs (PA) and civil affairs (CA) The branch establishes priorities and plans the execution of IO between joint and Army organizations; it also provides input to the CTL for lethal and non-lethal targeting through a comprehensive nodal analysis. Finally, the branch represents the JFLCC at the JFC's IO board or convenes an IO working group for the JFLCC, if the JFLCC is designated as the JTF.

AFATDS provides quick-fire links.

Land Information Warfare Activity (LIWA) personnel augment the C^2W branch. The Joint Command and Control Warfare Center (J^2C^2W) and Joint Warfare Analysis Center (JWAC) also may augment the C^2W branch when Third Army functions as a JTF.

EW Branch. This branch is the G3's proponent for planning, coordinating and integrating EW operations with other combat disciplines using non-lethal fires. EW is an element of IO and works to ensure maximum synergy in support of the overall IO effort. The G3 EW officer is a member of the Third Army IO working group.

When Third Army/ARCENT performs its role as a JTF, a joint force commander's EW staff (JCEWS) is formed to coordinate EW activities in the staff and with components. The JCEWS reviews EW target nominations and ensures electronic frequencies are deconflicted.

Primary responsibilities of the EW branch include coordinating between EW, intelligence and operations agencies to determine whether expected advantages of EW operations outweigh potential losses of intelligence capabilities; assessing friendly and enemy effects of EW activities on operations; recommending and developing EW targets for the JFLCC CTL; coordinating input for the joint restricted frequency list (JRFL) and assessing situations requiring frequency deconfliction; and chairing daily JCEWS meetings.

PSYOP Branch. The PSYOP branch serves as the G3 proponent for PSYOP activities. The branch plans and coordinates PSYOP among military and governmental intelligence and operations agencies, assesses friendly and enemy effects of PSYOP activity on operations, recommends and develops PSYOP targets for the JFLCC CTL, and deconflicts PSYOP activities with other lethal and non-lethal disciplines. The PSYOP branch also serves as a standing member of the operational planning and the IO working groups as well as other internal and external coordination boards.

The success of the JFLCC commander's battle plan depends heavily on the ability to plan, coordinate and execute deep operations using joint and coalition fires. To maximize deep operations effectiveness, the commander must understand the capabilities each US service and coalition nation bring to the fight. It's vital that everyone clearly understands the JFLCC's guidance and intent—from the JFACC down to the executor.

The DOCC is the agency for making joint deep operations "happen" for the ground force. It must understand and apply complex concepts and appropriate tactics, techniques and procedures (TTP) to employ deep fires to meet the land force commander's targeting objectives. The DOCC is the link for deep operations success on tomorrow's joint battlefield.

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Joint Tactical Radio System

Volume, Distance and Speed

It's no secret that the "King of Battle" has determined the outcome of many battles from its earliest days of massive bombardments to today's precision smart munitions. One aspect of FA operations has remained constant: Cannoneers have to know where the enemy is and be able to communicate with the guns fast enough to put rounds on target, on time. The joint tactical radio system (JTRS), which will begin fielding in 2002, will allow today's Redlegs to communicate huge amounts of digital data over greater distances at "sensor-to-shooter" speeds.

This future radio system will give the joint task force (JTF) commander a seamless, dynamic communications network for his battlespace with the speed and automatic routing to provide real-and near-real-time voice, video and data simultaneously for theater-wide situational awareness. JTRS will maximize the wideband network waveform to provide huge amounts of bandwidth and incorporate the Tactical Internet. It will be interoperable with civilian, Army, joint and multinational legacy communications systems.

Today's units can send orders electronically. They can interoperate with joint and multinational forces. Units can tap civilian networks. And they can access a real-time video capability. But our units can't do all these from one communications system. For these capabilities, the Army must rely on multiple systems: the single-channel ground and airborne radio system (SINCGARS), the enhanced position location reporting system (EPLRS), the near-term digital radio (NTDR), mobile subscriber equipment (MSE) and satellite communications (SATCOM). JTRS will satisfy all these requirements in one system.

Operational Concept. JTRS will be a wireless, secure, multi-band/multi-mode digital radio. It is being scaled for use in all domains: airborne, ground, mobile, handheld, fixed station, maritime, civilian and personal. It's being designed as an open system of architecture based on a common communications system architecture—interoperable with legacy communications systems and capable of accepting future technology insertions.

When the JTRS is ready for fielding, it initially will be fielded to battlefield operating systems (BOS) that need multiple radios, such as the fire support BOS. The FA will have JTRS that are configured and programmed for simultaneous operations on multiple bands and modes across multiple networks while automatically routing within and between applicable local and Internet networks.

The radio will have plug-and-play versatility in field-configurable modular hardware that operates on the move. It will include embedded position location and automatic situational awareness feeds to and from networks.

JTRS Development. The Joint Program Office (JPO) is taking an aggressive approach to developing and procuring this radio system. On 28 June, the JPO announced the Modular Software Radio Consortium (Raytheon) System Architecture had been selected for JTRS. Next, the consortium will develop prototypes and demonstrate the architecture and its interoperability. A second consortium will build the same architecture and develop some or all of the optional waveforms. Then the two will swap waveforms and related technologies to validate the compatibility and openness of the selected architecture.

The first consortium must provide the following eight wave forms: HF Automatic Link Establishment (ALE), VHF FM, VHF Public Service, UHF Demand Assigned Multiple Access/Demand Assigned Single Access (DAMA/DASA), VHF for Air Traffic Control (ATC), VHF FM, UHF Have-Quick I and II and a vendor proposed wideband. The JTRS will focus on the vendor's proposed wideband networking waveform. The second consortium must provide some or all of the following optional waveforms: SINCGARS, EPLRS, Link 16, NTDR and Internet Control (INC).

With this fast-paced contracting and procurement method, the JPO hopes to have an improved tactical operations center (TOC)-to-TOC radio system for fielding, beginning in FY02. The first vehicle and manpack versions of these radios should be fielded to the 82d Airborne Division, Fort Bragg, North Carolina, in FY05. The JTRS will provide the future JTF commander a mobile, dynamically reconfigurable, theater-wide information grid with sufficient reliability, capacity, interoperability and security to fight his battlespace. He will be able to tailor the system to provide the support networks he needs for time-critical missions.

For more information about the JTRS, go to the JTRS JPO home page at www.jtrs.sarda.army.mil or the Training and Doctrine Command (TRADOC) System Manager-Tactical Radios (TSM-TR) home page at www.gordon.army.mil/tsmtr.

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