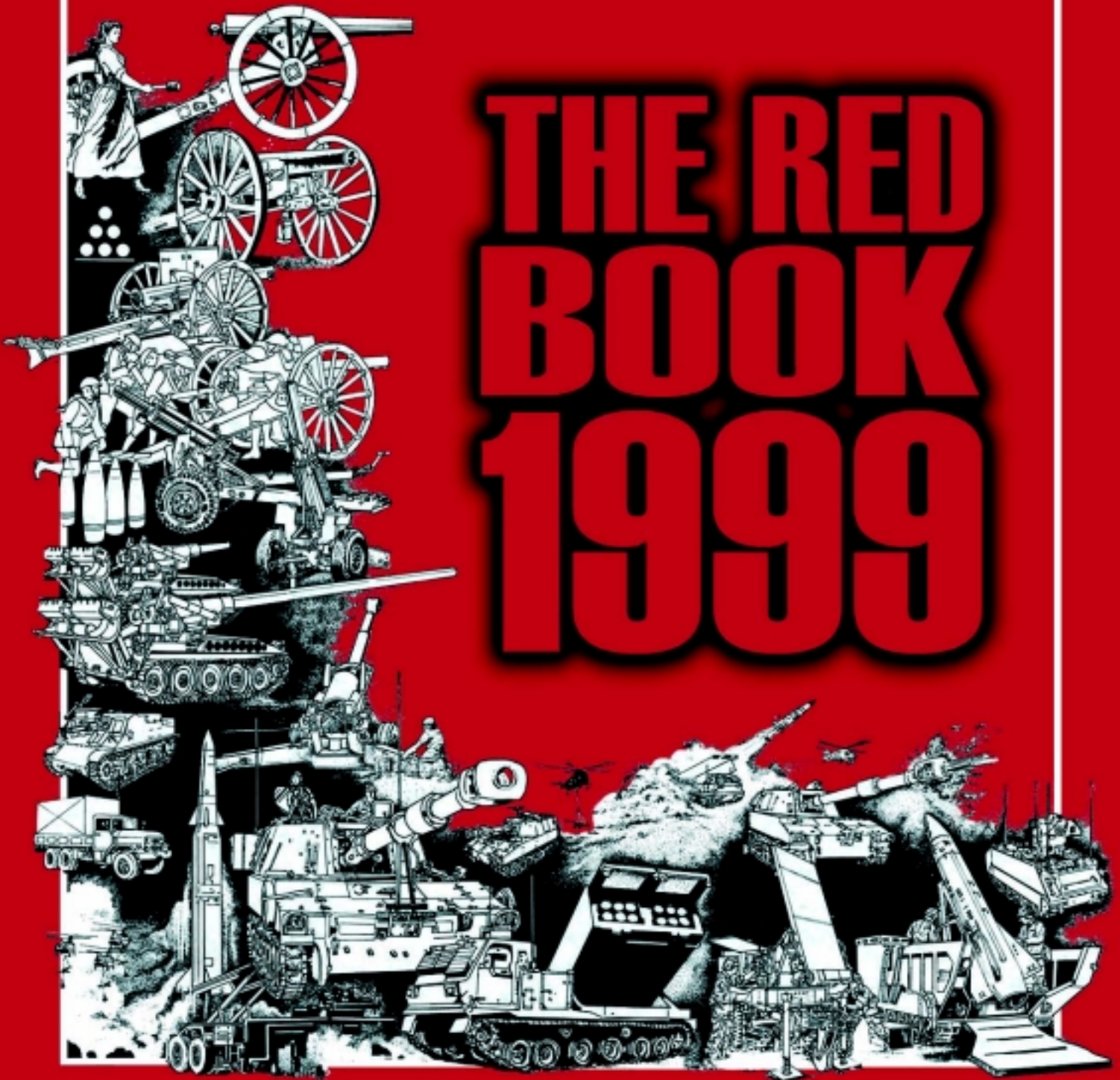


Field Artillery

A Professional Bulletin for Redlegs

November-December 1999

THE RED BOOK 1999



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The line art on the front cover is by Donna Jeanne Covert, former Art Director of Field Artillery, and was taken from the poem "I Am the Field Artillery" by the late John J. McMahon and Patricia S. Hollis.

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Assessing the Branch

Usually in this edition, the Chief of Field Artillery writes a “State of the Branch” article that’s a comprehensive review of the Field Artillery. I’ve elected not to do so this year in favor of presenting some issues on my mind as I assess our branch.

In the past three months, I’ve visited units around the world: the 2d Infantry Division and Division Artillery (Div Arty) in Korea; 1st Cavalry Division and Div Arty at Fort Hood, Texas; two National Training Center rotations (heavy and light) at Fort Irwin, California, one with the 2d Battalion, 82d Field Artillery (2-82 FA) of the 1st Cav and one with 1-37 FA of the 2d Infantry Division and C/2-82 FA of the 25th Infantry Division (Light), Hawaii; our 40th Infantry Division (Mechanized) Artillery of the California Army National Guard; the III Armored and XVIII Airborne Corps Artilleries here at Fort Sill and Fort Bragg, North Carolina, respectively; and the Third US Army while serving as the Joint Force Land Component Command (JFLCC) for Central Command during Bright Star in Egypt. If I haven’t visited your unit—standby, I’ll be there!

I’m assessing fire support and FA units from the combined/joint task force (CJTF) to the battalion level, heavy and light unit requirements, and close support and precision deep attack fires. My first observation: our soldiers, NCOs and officers are *magnificent*. Our officer leadership is strong and adaptive, our NCOs are skillfully leading and training our soldiers, and our soldiers are, quite simply, the best I’ve seen in 31 years of service.

The insights I’m gaining during these visits will influence my initiatives on doctrine, training, leadership development, organizations, materiel and soldiers. These visits have given me hundreds of issues to consider, three of which I’m sharing with you in this column.

Close Support for Combined Arms Operations. In the September-October edition, Major General Carl F. Ernst, former Chief of Infantry, posed a question in his article titled “Is the FA Walk-

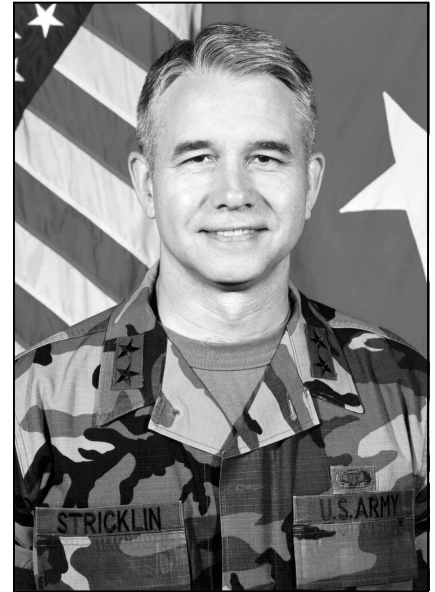
ing Away From the Close Fight?” My short answer to that question is, “No!” But my long answer recognizes we must resolve some doctrinal, training, equipment and organizational issues to dispel his and other maneuver commanders’ perceptions.

We have several things to do. Through simulations, we routinely and seamlessly must be linked to the maneuver units we support to maximize combined arms training at home and when deployed in security and stability operations. We have some longstanding Combat Training Center (CTC) trends we need to reverse. We must revise our fire support doctrine that is cumbersome to execute. We must fill the gaps in our fire support doctrine and training for the CJTF and JFLCC levels and the shortfalls in our doctrine for the corps, division and brigade levels. To some degree or another, all these challenges impact on close support for combined arms operations.

Fire Support Doctrine. Our published fire support doctrine remains remarkably unchanged since the early 1980s—forward observers (FOs), fire support teams (FISTs), fire support officers (FSOs) and fire support coordinators (FSCOORDs) are required to execute fires on specified FM radio nets in an environment that expects digital fire plans and execution. I’m a product of that published doctrine and have executed it to the best of my ability—just as you have. But it’s too complex, if not impossible, to execute with repeated success.

We must simplify our doctrine and find more efficient ways to employ our FOs, FISTs, FSOs and FSCOORDs. The CTCs have done a lot of work to simplify the complexities of today’s fire support doctrine. Therefore, I’m delaying the publication of further fire support doctrine until we’ve worked through our options.

Captain Retention. We’re experiencing alarming difficulty in retaining our branch captains. Today’s captains are our battalion commanders of 2008, our Div Arty Commanders of 2012 and,



one of them, the Chief of FA in 2020. In short, they’re a big part of the future of the FA.

I’ve asked the FA Branch at the Total Army Personnel Command in Alexandria, Virginia, and the Proponency Office at the FA School here at Fort Sill to conduct analyses of why so many captains are leaving the FA. I also have asked our FA brigade and Div Arty commanders to help assess the problem. And I, too, have been talking to young officers during my travels, trying to understand this dynamic.

So, attention all FA captains who are leaving or thinking about leaving the FA and Army: Why? Please send me a short email explaining the single factor that has most influenced your decision to leave (stricklin@doimex1.sill.army.mil). Your message will remain with me; you will get no emails or phone calls in return. But I will use your information to determine what the problem is and how to fix it for the betterment of our great branch.

Next year in my State of the Branch article, I’ll report my findings—the solutions to these and, perhaps, other issues and report to you the state of our branch. But for now, thanks for everything that you are doing every day of the week and have a *Happy Holiday, Redlegs!*





INTERVIEW

Lieutenant General Edward G. Anderson III
Director for Strategic Plans and Policy, J5, Joint Staff

Redefining "Jointness" for the 21st Century

Interview by Patricia Slayden Hollis, Editor

Strategic Plans and Policy, J5, serves as an agent for the Chairman of the Joint Chiefs of Staff to advise the National Command Authority on military matters. The J5 develops advice for the Chairman to give the President or Secretary of Defense on current issues through various interagency levels, takes the resultant guidance and translates it into strategic plans and policies for the services or commanders-in-chief (CINCs) to implement. The "interagencies" are those of the security apparatus of our nation: the National Security Council (NSC), Department of State, the Central Intelligence Agency (CIA), etc.

The J5 is responsible for military strategy and policy, the best known being the National Military Strategy. This is the military answer to the NSC's National Security Strategy. J5 also is responsible for the Unified Command Plan for the 21st Century that outlines the future for our military services, specifically the CINCs.

Q What do you see as the future of joint military organizations and warfare in the next century?

A Revisions to our Unified Command Plan (UCP) are already making significant changes. For example, on the first of October, the Atlantic Command was redesignated the Joint Forces Command. Although that may not sound like a big deal, let me tell you, it is a *big deal*.

The Joint Forces Command CINC will redefine "jointness." He will be the force provider for the regional CINCs and responsible for some joint concept development, training, force integration, doctrine, deployment and experimentation. It's going to take awhile for the Joint Forces Command to grow it to full capacity. But I submit that we haven't really experienced jointness yet and that we're going to see a lot more truly integrated forces. And as we move toward more jointness, Field Artillerymen are going to have to think through the fire support implications.

As we look to the future, we're going to see more emphasis on homeland defense. Many people might say, "What

are you talking about? Nobody is going to attack the United States." Well, that's not entirely true. It might be that no one is going to attack us with, say, an army, but our enemies may attack with electrons and other terrorist acts, and we have to be postured to respond to that. The most serious threat we could face would be a threat to our own country.

Another area of emphasis for the future is information operations. We've learned a lot about information operations, particularly in Kosovo. Clearly, they're going to play an important role in future warfighting. We've made some adjustments in the organizational structure of the CINCs to accommodate information operations, and the Space Command is picking up additional information operations responsibilities.

These are changes I see coming to the future joint force, and the Army is going to play a major role in all this.

Q Based on the world situation and our continued involvement in operations around the globe, can we fulfill the mandates of our National Military Strategy: win two nearly simultaneous major theater wars?

A Yes—that's clearly our responsibility, but it's also clearly going to be hard. And the level of risk depends on which scenario we find ourselves in. Which theater goes to war first—Iraq? Korea? How fast does one follow the other? The answers to these and other questions determine the level of risk involved in fulfilling that mandate. At the higher levels of risk, we may have to accept more casualties, perhaps in one theater more than the other. That's not something we're comfortable with, but we very well could face that risk.

Yes, we can execute the National Military Strategy, but there are several things we need to do to minimize risks. *Modernization*—we must ensure we maintain superiority in capabilities over any other military in the world. *Readiness*—quality personnel and training—is critical to our ability to prosecute two major theater wars almost simultaneously. We also have to build and maintain *coalitions and alliances*. We've already seen in many contingencies, most recently in Kosovo, that we must be part of a coalition team. Next, the US military must remain trained in *joint* operations. It's a fact that everything we do in the future is going to be done in a joint context.

Q What are the most significant lessons we've learned in Bosnia and Kosovo? In continuing operations in Iraq?

A Although we learned a great deal in Bosnia, the Joint Staff did not formally document that information. Today the entire Joint Staff is documenting what we've learned in Kosovo, focusing on our national strategic and, to a degree, operational lessons learned.

The most obvious joint lesson in these kinds of crises is the importance of being able to operate within an alliance—not just militarily, but politically. That was one of the biggest challenges in Kosovo but also one of the greatest strengths. NATO stood together as an alliance for operations in Kosovo for 78 days...that surprised a lot of people in NATO. For 50 years, NATO has stood ready. But Kosovo was the first time NATO countries came together as an alliance to fight in a real-time context. We learned a lot.

From the perspective of the J5, we learned the incredible role the inter-agencies [NSC, CIA, etc.] play in applying national security and national military strategy in conflicts such as Kosovo. Our national security inter-agencies had day-to-day situational awareness and were involved in decisions driven partly by the alliance and partly by political dynamics. We, as the nation's military experts, *must* learn how to operate in that environment, so we can ensure national decisions don't affect the abilities of our military forces involved to accomplish their mission. Kosovo was a real eye-opener.

Q *What is the impact of the high personnel tempo (PERSTEMPO) for soldiers, sailors, marines and airman in such deployments and operations around the world?*

A Such a high PERSTEMPO creates problems in terms of retaining and, even to a degree, recruiting people. At a time when the national economy is very strong, we are competing with industry for good people. There are a lot of variables that play in that equation—certainly money is one for the young people we are trying to recruit. Chairman [Hugh] Shelton surfaced these issues to Congress, and he and the Joint Chiefs have been instrumental in getting more money in the next budget for military benefits.

Here in J5, we're sensitive to PERSTEMPO issues because one of our responsibilities is to ensure America commits her forces as the last option. Committing forces can happen far too easily, and then it's difficult to disengage.

As recent times have shown, America can expect to have about 260,000 of her active duty military sons and daughters in foreign countries, either forward-based or deployed for special missions or crises at any one time. And of that number, about 100,000 of them are going to be in the active Army. We have US military personnel in Kuwait, Bosnia, Kosovo, Haiti, Korea and many other locations. And most of these crises are on different maps—we're engaged all over the world.

If you read the newspapers and watch the news, you'll know what we spend a lot of time doing here at J5. Who would have thought just a few days ago that we



In Moscow, Lieutenant General Anderson (center) looks at the map board and listens to a Russian briefing during a theater missile defense exercise with Lieutenant General Smirnov (second from the right).

would have maps of East Timor in all our offices and would be watching the situation very closely? Of course, we're pleased that Australia has taken the lead in East Timor, but my point is how can we predict where the next crisis will arise of all the possibilities in a very unstable world?

So in the J5, we have been involved in a major effort to reexamine where our military is engaged worldwide and determine the locations from which we can safely disengage. This effort is to ensure we can continue to respond to crises, both those ongoing today and those yet unknown. This helps reduce our PERSTEMPO.

We've had some success. We freed up Task Force Able Sentry in Macedonia, about one battalion, and reduced our forces in Bosnia. Then conflict arose in Kosovo—obviously, unexpectedly. We're bringing a battalion or so out of Haiti. These examples are not much in terms of numbers, but the inter-agencies often are reluctant to support the withdrawal of our forces from trouble spots.

At the same time, we continually guard against getting involved in a crisis with an ill-defined military mission, one that's open-ended and requires a large commitment of forces.

During these periods of increased PERSTEMPO, we have had to look at ourselves from the inside, particularly the Army, to make sure we aren't creating an environment leading back to "zero defects." That's quite a temptation. There's a lot of pressure in these high-visibility deployments into sensitive crises where everyone has situ-

ational awareness and a soldier's actions could have international ramifications. I'm sensing the pressure is leading to more intense supervision and a zero-defects mentality is starting to creep in. We need to look at ourselves carefully and know what we're doing to take care of our soldiers—the best the world has ever known.

Q *Where should Army organizational, doctrinal and modernization efforts be focusing on to be most effective as the nation's land force in the 21st century?*

A We must stay focused on accomplishing the hardest mission—warfighting. As we look at the future, there's no question the Army has got to be more versatile—more deployable, lethal and agile. ...all of those. The Chief of Staff of the Army's initiative to create highly lethal combat brigades that are deployable anywhere in the world within 96 hours is on-target and will make the Army more versatile along the entire spectrum of operations.

For an operation such as Kosovo, for example, we needed initial entry forces to come in and sustain operations in a large area. It was a large undertaking as we divided Kosovo into the various regions. Although our Marine Corps was critical for initial entry operations in Kosovo, a highly deployable combat brigade, had it existed, would have added lethality and sustaining capabilities to complement the Marine Corps'.

At the same time, we need to be careful that in the process of making heavier

forces more agile and lighter forces more lethal that we don't sacrifice too much...such as survivability. As an institution looking at long-term modernization, we don't want to cause the "two ends"—light and heavy—to meet in the middle until we have the technology in place to accomplish the mission at either end of the spectrum of operations. We must not be squeezed by resource limitations and pressured for capabilities focused at the lower end of the spectrum to lose sight of our ultimate responsibility to the nation: warfighting.

Another important caution for the future is that we don't "box in" our forces in doctrine. Our doctrine has to be flexible enough to apply along the spectrum of operations and relevant enough for multiple environments. We've got to be able to adjust the way we do business in the context of what the environment dictates.

Now, let me give you an example of what I'm talking about in terms of deep operations—operations that the FA is involved in. We have a fairly specific, excellent deep operations framework that is very enthusiastically and religiously applied to wargaming and other processes in combat. But the reality is that the same framework may not be totally applicable in some situations. Do we need the full deep operations doctrine designed for a major threat, such as Iraq or Korea, to fulfill deep operation requirements in, say, Kosovo? Maybe all we need is a joint targeting process looking deep for operations at the lower end of the spectrum.

Looking at those joint doctrinal implications is one of the jobs of the new Joint Forces Command. The Army needs to be heavily engaged in that process, understanding that all doctrine must work within the joint context.

Q *What does the FA need to do to be most effective in the 21st century?*

A The FA is on the verge of a major shift. Technology is moving in a direction that will significantly enhance our capabilities.

We've got to make sure that we can capitalize on emerging technologies. Many of our major modernization programs will do just that—specifically, Crusader [21st century howitzer and

resupply vehicle], SADARM [sense and destroy armor munition], BAT [submunition that kills moving armored vehicles] and our AFATDS [advanced FA tactical data system, the Army's first digital command and control system].

The FA is becoming significantly more accurate, responsive and reliable than ever before. Consequently, we're becoming a much greater contributor to a major theater of war—able to more effectively shape the battlefield for the maneuver commander.

As the advanced capabilities of the FA/fire support system-of-systems come together, the land force will undergo a paradigm shift. As a traditional supporting arm, the FA will shift to become the supported arm in many situations—maneuver will support the FA. By providing advanced fire support capabilities, the FA will be able to fight deep to best advantage while retaining its ability to execute the close fight with absolute precision and responsiveness in all weather conditions.

Q *If we remain a nation with an aggressive worldwide engagement policy in support of democracy, humanitarian assistance and conflict prevention, what officer and NCO skills might we need to develop?*

A With the proliferation of operations at the lower end of the spectrum, some think we need to develop Cannoneers, cooks and clerks to become "soldier diplomats" simply because of their frequent interaction with international forces in high-visibility environments. But that's happening. Our folks are doing a *great* job in Kosovo.

Warfighting is our primary mission, and that's what we must continue to train for. Our training system already accommodates stability operations.

But what we *must* do is continue to emphasize our values—loyalty, duty, respect, selfless service, honor, integrity and personal courage. Our soldiers must remain disciplined and dedicated to Army values so "living them" is second nature in crisis situations. Again and again, I hear from civilians and military around the world that our commitment to values is the one thing that distinguishes our military from others. This is a strong quality and part of our culture, a part we cannot afford to lose.

Now, in terms of training, we need to train in the joint arena more—and we're going to. The Joint Forces Command will be partially responsible for defining the regimen for both individual and collective joint training. At the battery level, the impact of jointness will be minimal on our NCOs' and junior officers' day-to-day operations. But jointness will have a great impact on all levels above the battery.

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

A I have the privilege of representing our troops (soldiers, sailors, airman and marines) to national and international leaders, both civilian and military. These leaders consistently tell me the US military and, specifically, the US Field Artillery, enjoy a tremendous reputation for being able to get the job done and done right. Our troops and their leaders in the field make me incredibly proud of what they do in representing our country around the world. I recognize the great privilege and honor I have to work for their interests within the interagency and in support of our national leadership.

I challenge and encourage Artillerymen everywhere to continue their important service to our nation. I recognize their sacrifices and the excellence of their commitment to duty...and so do our nation's leaders at the highest level.

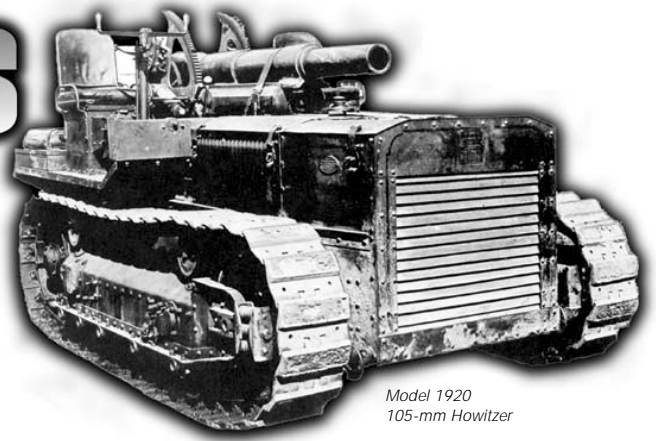


Lieutenant General Edward G. Anderson III has been the Director for Strategic Plans and Policy, J5, on the Joint Staff at the Pentagon since 6 August 1998. In his previous assignment, he was the Commander of the Army Space and Missile Defense Command in Arlington, Virginia. Among other assignments, he served as a member of the Joint Requirements Oversight Council Review Board as the Assistant Deputy Chief of Staff for Operations and Plans (DCSOPS) for Force Developments at the Pentagon. In Germany, he was the Assistant Division Commander of the 1st Armored Division and then the 3d Infantry Division (Mechanized). He commanded the 17th Field Artillery Brigade, part of VII Corps in Germany, and, previously, the 1st Battalion, 18th Field Artillery, 17th Field Artillery Brigade.

From Horses to Tractors

Implications for Army XXI

by Major John D. Hall



Model 1920
105-mm Howitzer

As we transition from the Army of Excellence (AOE) to Army XXI, we see a wide range of opinions regarding the future of automated command and control systems (C²). Some of us envision a digital environment where information is collected, processed and displayed in near real-time, forming a situational awareness commanders and staffs can use to make decisions faster than the enemy. Others predict a setting where expensive, high-tech equipment is underutilized because it's difficult to operate and maintain in a tactical environment, it doesn't support the commander's desired view of the battlefield or both. Most believe that the potential for digitized C² systems is strong, but we also agree that flaws exist with the systems in their current state and that significant improvements are required before automated C² systems can replace the manual systems used throughout the Army.

Rapid technological transformation in a short period of time is not new to our Army. The last revolution in military affairs (RMA), at least at the ground tactical level, occurred in the between-war years of 1919 to 1941. The weapons, vehicles and communications systems that appeared in World War I posed questions for the post-war Army not unlike those we face today: What is the

military potential of these newly developed machines? How do we best make use of them? How much can we afford to spend on developing and fielding them?

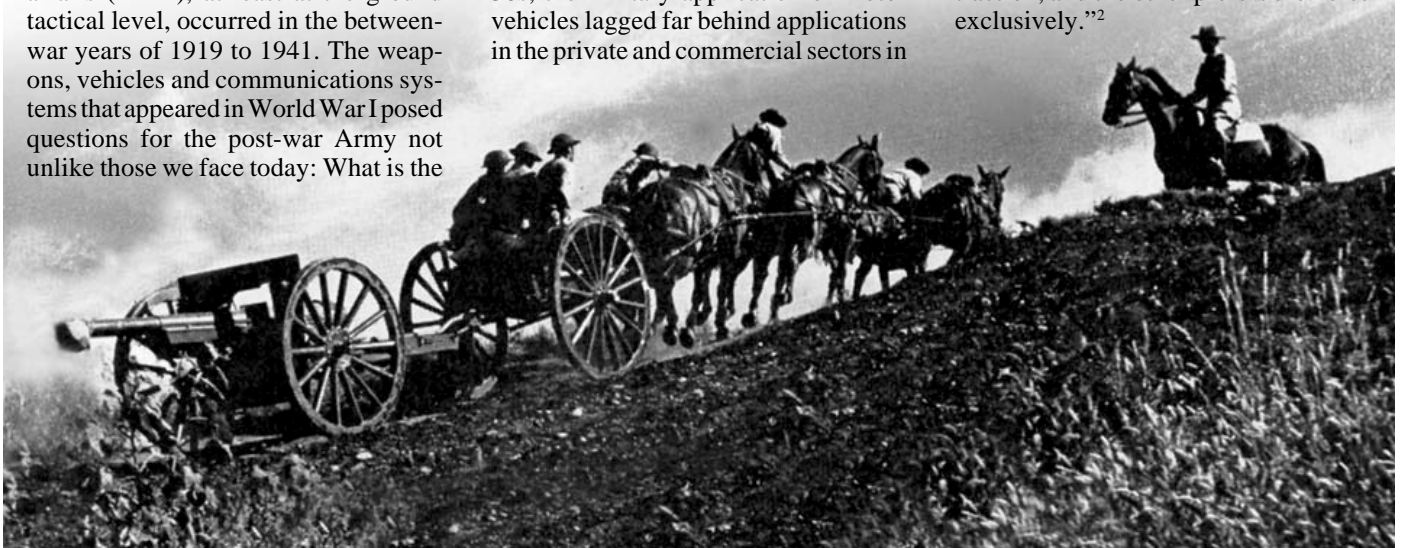
These were, and still are, difficult questions to answer. In the years immediately following World War I, the Hero, Lassiter and Westervelt Boards were established to examine emerging weapons, motor vehicles and communications systems to determine what had merit and what did not. These three boards established a basis for experimentation and debate that would dog artillerymen for almost 20 years: Should the tractor or some other form of motorized transport replace the horse as the prime mover for light artillery pieces?

Horses versus Tractors. This issue has some amazing similarities to that of automated C² systems on future battlefields. Horses were a proven, reliable method of moving guns across the front just as the manual decision making and C² systems we employ today are proven, reliable methods of planning and executing operations. In the 1920s and 30s, the military application of motor vehicles lagged far behind applications in the private and commercial sectors in

much the same way the application of computers within the Army lags behind that in the private and commercial sectors today. Likewise, the introduction of motorized artillery would require massive retraining of crews, leaders and support personnel just as the introduction of automated C² systems will.

The concept of motorizing medium- and heavy-caliber guns was never really an issue because it was clear to even the most traditional artilleryman that the size and weight of these new pieces meant horses simply could not pull them effectively. The controversy centered on division-level artillery systems and how to best move them.¹

Major W.E. Burr's award-winning essay, "Some Aspects of American Field Artillery," published in the *Field Artillery Journal* the summer of 1922 posed that "The advent of the tractor has revolutionized our ideas regarding traction...much can be said in its favor, and much against it. We are divided at present as to its use. One extreme advocates the use of the tractor for all gun traction, and the other prefers the horse exclusively."²



In the 1990s, one could easily change the statement to read, “The advent of the *computer* has revolutionized our ideas regarding *battle command*... Much can be said in its favor, and much against it. We are divided at present as to its use. One extreme advocates the use of *computers* for all *aspects of battle command*, and the other prefers the *manual system* exclusively.”

Some proponents of motorization urged a rapid transition from horse-drawn to towed artillery. One participant in the Lassiter Board tests, First Lieutenant Guy Taylor, wrote that motor vehicles gave the Field Artillery speed, power and the ability to make longer movements. Another, Brigadier General William Cruikshank, felt that the success of the tests justified the motorization of all Field Artillery systems as rapidly as equipment could be made available. These eager reformers convinced Major General Fred T. Austin, Chief of Field Artillery, and his successor, Major General Harry G. Bishop, that motorization had sufficient potential to warrant further experimentation. Bishop would later take a position that was highly critical of the War Department’s reluctance to motorize light artillery, especially in light of commercially available trucks and tractors that by 1931 were clearly suitable as prime movers.³

Conservatism among a number of Army officers of the time had an overwhelming influence on the War Department, which in turn led to a cautious approach toward the development and fielding of towed artillery. These officers were trapped in the midst of a technological revolution that made it difficult to accept the many changes going on around them. Led by Major General Robert M. Danford, some felt the Army should retain at least some horse-drawn artillery indefinitely, arguing that horses were superior to motorized vehicles for moving light artillery through difficult terrain.⁴

Even these obstinate officers realized that horse-drawn artillery would eventually become obsolete, but their fears about reliability and lack of technical orientation combined with an apprehension about restructuring tactics, doctrine and organization made the transition long and difficult. Even as late as 1941 when motor vehicles were firmly entrenched in American society, many officers retained their horses and the Army still had a mixture of horse- and motor-drawn artillery.⁵

Crusader howitzer crew cab; lower right is the howitzer with resupply vehicle.



“We owe it to our soldiers, our nation and ourselves to keep an open mind regarding the development of new hardware and the tactics, techniques and procedures that accompany it.”

Other artillerymen took a moderate approach to motorization. Major Burr expressed their sentiment when he wrote: “The days of gas-driven vehicles for our guns are approaching rapidly. The greatest problem is the proper training of our personnel of all ranks. We are not competent now to operate our motor vehicles at their maximum efficiency. If the mechanical progress continues at its present rapid rate and our instruction does not keep pace, we shall be very derelict in our duty.

“In addition, let us not forget that no matter what the circumstances may be, we must always be prepared and able to fulfill our combat mission, namely, the delivery of our fire when needed. For this reason, our experiments must be conducted as such and our fighting ability remain unimpaired. It is believed that our present policy is somewhat unsound, for within the divisional brigade we have motorized the howitzers and left the rifles horsed. It is a bad principle, for the most recent tests indicate that the tractor is not the equal of the horse as yet for combat purposes.”⁶

Major Burr’s concerns were far from unwarranted. There were serious training issues involved with motorization. More importantly, motor vehicles of the 1920s and 30s did in fact have serious reliability problems. They required a lot of maintenance, were expensive and were not as good as horses when moving through harsh terrain. Advancements in vehicle design continued rapidly, however, and as dependable tractors and trucks with cross-country capability became available, the

number of officers who felt the time had come to make the transition continued to grow.

Unfortunately, the conservatives influenced the War Department more than the growing supporters of motorization. The War Department continued to withhold modernization funds and, thus, stalled the conversion to motorized prime movers until 1933. Even after funds for motorization were made available, the War Department was never more than a reluctant supporter of the modernization of prime movers.

The result was that on the eve of World War II, the Field Artillery was characterized by antiquated weapons and thinking, putting us far behind our future enemies. Broad-minded thinkers like Bishop, Cruikshank and Taylor tried to keep the Field Artillery up with the changing times, but they were opposed by conservatism and a lack of funds. Thus, when war broke out in December 1941, the Field Artillery was poorly prepared to fight an enemy that had adopted the latest in weapons and tactics.⁷

Army XXI Implications. What then, are the lessons we can learn from the 20 years of controversy surrounding the motorization of light artillery? Do the problems associated with making the transition have any bearing on today’s Army as it moves from manual to automated command and control systems?

One message we need to keep in mind is that we should not hastily jump into a modernization program based on the success of one or two experiments. Clearly, progressive thinkers like Tay-

lor and Cruikshank had a vision of the future that accurately predicted the impact of motor vehicles on the Field Artillery. The problem wasn't with the vision, but rather the equipment available at the time. The cross-country capability and reliability of motor vehicles didn't progress to a point where they were superior to horses until about 1930. An influx of funds from the War Department might have sped development somewhat, but the fact remains that the technology was not sufficiently developed to support shifting from horse-drawn to towed artillery at the time Cruikshank and Taylor wanted to.

Had the Army transitioned to motorized artillery in the 1920s instead of the 1930s and then gone to war in 1932 instead of 1942, the results may have been disastrous. Rather than recommend an immediate shift from horses to tractors, as Cruikshank and Taylor proposed, General Bishop wisely chose to use the results derived from the Lassiter Board as evidence that the concept of motorization was sound and that further experiments should focus on developing a vehicle that had the mobility and reliability required.

Another point to keep in mind is that undue conservatism can result in a loss of superior weapons technology and tactics. Most of us are apprehensive when it comes to change, especially when it is both rapid and drastic: the more experience we gain through training, assignments, etc., the more we are inclined to want the future to remain within the context of that experience. The quandary is that we live in a dynamic world.

It wasn't until 1939 when the Army began digesting lessons from the Spanish Civil War and observing the battles of World War II that we realized we had made serious miscalculations regarding the impact of motorized artillery on the battlefield. Later, we paid a terrible price for our failure at places like Kasserine Pass and Guadalcanal.

We owe it to our soldiers, our nation and ourselves to keep an open mind regarding the development of new hardware and the tactics, techniques and procedures that accompany it. Our desire to operate within our "comfort zone" has to be balanced by the recognition that change is inevitable and that we had better pay the cost up front through research, development and training than pay later in blood and failure to achieve our national security objectives.

Major Burr's position on motorization was clearly the most balanced of those discussed. He recognized early on that motor vehicles would replace horses, but he also knew that considerable work remained before tractors or trucks took the place of horses. Burr perceived that a radical realignment of tactics, logistics and doctrine had to accompany the introduction of motor vehicles, and although he recommended a rapid transition to towed artillery, he cautioned the Army to avoid a total fielding of tractors until a suitable training base could be developed and the tractors' reliability and cross-country trafficability improved.

We are in the same position today with the automation of command and control systems as Burr and his contemporaries were in 1922. The good news is that the Army has, in a large part, attempted to integrate the same ideas he wrote about into our Army XXI development strategy. The concept of spiral development, where doctrine and tactics are developed concurrently with hardware and software, is directly related to the notion that fielding new hardware alone is not enough to guarantee success on the battlefield.

The Army's program of a series of experiments, each with limited objectives, to assess the potential of automated command and control helps us maintain a balanced, systematic and steady approach toward achieving our objectives. Thus, at least as an institution, the Army has learned some valuable lessons from the interwar years and has established the right programs to ensure steady technological progress.

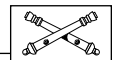
But a sound institutional program does not imply that we are saved from making poor decisions as we move toward Army XXI. The same challenges that faced individual artillerymen between 1919 and 1941 remain with us today. Today's soldier must recognize that computers are here to stay and that just because our previous methods were effective does not mean they will remain so. We must always keep in mind that our reluctance to support change, although natural, can be counterproductive. We need to encourage creativity and "out of the box" solutions to the problems we expect to face in the future and constantly ask ourselves how we can maximize the capabilities that information age technology might afford us.

At the same time, we must temper the enthusiasm generated by fresh ideas

and successful experiments with a constant measure of reality. We are no more ready to fully field automated command and control systems to the Army in 1999 than we were ready to replace all of our horses in 1922. Issues such as the display of battlefield information on computer screens, the deconfliction of incoming data and the challenges of establishing and maintaining a tactical digital network indicate that despite significant progress, the time for full automation has not yet arrived.

We need to maintain our ability to recognize when a concept or piece of equipment lacks potential and, more importantly, ensure we clearly articulate legitimate shortcomings to the Army's decision-makers. Otherwise, we become part of the problem rather than part of the solution.

In short, we have some great "tractors" coming our way, but let's make sure they can handle the load before we shoot all our horses.



Major John D. Hall has conducted significant research on the impact of automation on command and control decision making. While serving as the Deputy Operations Officer for Operations Group A of the Battle Command Training Program (BCTP), Fort Leavenworth, Kansas, he helped integrate the various simulations used in the Division Advanced Warfighting Experiment (DAWE) in November 1997 at Fort Hood, Texas. In addition, his thesis for his Master of Military Arts and Science from the Command and General Staff College, Fort Leavenworth, is devoted to assessing the impact of the maneuver control system (MCS) on decision making at the division level. He commanded B Battery, 6th Battalion, 32d Field Artillery, part of the 212th Field Artillery Brigade, III Corps Artillery, at Fort Sill, Oklahoma. He also served in the III Corps Fire Support Element and, during Operation Desert Storm, as a battalion Fire Direction Officer and Assistant S3 in the 3d Armored Division. Major Hall is currently a student in the School of Advanced Military Studies, Fort Leavenworth.

Endnotes:

1. Boyd L. Dastrup, *King of Battle: A Branch History of the US Army's Field Artillery* (Fort Monroe, VA: Office of the Command Historian, US Army Training and Doctrine Command, 1993), 188.
2. W. E. Burr, "Some Aspects of American Field Artillery" (*Field Artillery Journal*, May-June 1922), 183-185.
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4. *Ibid.*, 193.
5. *Ibid.*
6. Burr, 184.
7. Dastrup, 201.



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- FDS/BCS 6067
- Firefinder 6067
- FED/HTU 5607
- Fire Support Interoperability 6418
- C-1 Architecture 2233
- User Interface Requirements 6067

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Manual/Automated Gunnery 6224/5409

Unit-Level Logistics System (ULLS) 2323

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- OIC/NCOIC, Marine Cannon Crewman Course (MOS 0811) 5595/6811
- OIC/NCOIC, Survey Branch 6179/FAX 3216

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4th ID's 2-20 FA (MLRS) Dual Component

More than 100 National Guard soldiers from B Battery, 2d Battalion, 131st Field Artillery (2-131 FA), 49th Armored Division, Wichita Falls, Texas, were formally integrated into 2-20 FA (Multiple-Launch Rocket System), 4th Infantry Division (Mechanized), Fort Hood, Texas, in a ceremony 6 August. The National Guard battery joins the Active Component (AC) batteries of 2-20 FA in becoming the Army's first dual-component, 3x6, divisional MLRS battalion. The battery will use both designations, B/2-131 FA and D/2-20 FA, in its unique role as a dual-missioned battery.



Delta Battery soldiers have lives outside the military, working as network specialists, machinists, teachers, accountants and in other professions. When they put on their uniforms, which now have

both the 49th AD and the 4th ID patches on them, they become soldiers with the same mission as their active duty brethren in 2-20 FA.

In the process of modernizing and reorganizing as part of Division XXI, 2-20 FA is now comprised of a headquarters and service battery, two AC rocket batteries, a target acquisition battery and a National Guard firing battery. As part of its mission, 2-20 FA is the first FA unit to be habitually direct support (DS) to a divisional aviation brigade. 2-20 FA will train and deploy as a battalion, both active and National Guard soldiers, for worldwide contingency missions, including an upcoming rotation at the NTC, Fort Irwin, California.



Captains Professional Military Education

New Technology for the New Millennium

by Major David W. Cavitt and Melvin R. Hunt

As part of a Training and Doctrine Command (TRADOC) initiative, the Field Artillery School, Fort Sill, Oklahoma, transitioned from the FA Officer Advanced Course (FAOAC) to the FA Captains Career Course (FACCC) in the first quarter of FY99. To fully optimize technology and meet the educational requirements of Army 2010 and beyond, the instructional content of the new program of instruction (POI) is currently being developed for distance learning via web-based instruction for officers unable to attend the FACCC resident course at Fort Sill.

History of Captains Education Changes. In October 1994, TRADOC requested the Deputy Commandant of the Command and General Staff College (CGSC) at Fort Leavenworth, Kansas, review ways to gain efficiencies in the Captains Professional Military Education (CPT PME). The goal was to synchronize training with assignments and eliminate disruption to units and the backlog associated with the Combined Arms and Services Staff School (CAS³). Following a 1990-91 CGSC study and the subsequent work of the 1993-94 TRADOC Reengineering Study's Officer Education Process Action Team, CGSC developed a concept to merge the OACs and the CAS³ into a single course: the captains career course.

The goal of the CCC is to meet the Army's current needs and be relevant for Army XXI. The new course continues to prepare Active Army, Army National Guard (ARNG) and Army Reserve captains to command companies, troops and batteries and serve as staff officers with the Army in the field. It also synchronizes training and education with assignment patterns and minimizes disruption to the operating force.

Resident CPT PME. The CPT PME was to change through a four-phased evolutionary process.

Phase I. This phase is the previous education program. It consisted of a permanent change of station (PCS) to a 20-week branch OAC. In most cases, OAC was followed by one or more operational assignments during which an officer attended a nine-week CAS³ in a temporary duty (TDY) status. Phase I was completed when the last nine-week CAS³, Class 96-5, graduated on 9 October 1996.

Phase II. This phase shortened the CAS³ POI from nine to six weeks in October 1996 and synchronized the FAOAC completion dates with CAS³ starting dates in April 1997.

Phase III. Phase III is our current phase that reduced our FAOAC from 20 to 18 weeks. Officers PCS to branch schools to receive approximately two weeks of common core instruction fol-

lowed by 16 weeks of branch tactical, technical and warfighting instruction. After completing the 18 weeks, students move TDY to Fort Leavenworth for the staff process instruction and return to Fort Sill for final disposition (graduation). Phase III was approved in September 1998 and implemented by the Field Artillery School with Class 1-99 that reported 15 November 1998.

The content and course design for our 18-week resident FACCC is shown sequentially in Figure 1 on Page 12 by major block of instruction and associated hours. One change worth highlighting will begin in FY01. If instructor assets are available, we will incorporate advanced FA tactical data system

(AFATDS) instruction into our CCC and "track" automation instruction. Students will train on the initial fire support automated system (IFSAS) or AFATDS, depending on the system fielded to the unit the student will be assigned to upon graduation.

Phase IV. This phase would have used distance learning for CAS³ while students were attending CCC and, originally, was scheduled for implementation in FY02. The initial intent was that officers would PCS to a branch proponent for both the branch-unique and staff process instruction.

In July 1998, TRADOC decided not to implement Phase IV (staff process training via distance learning) as projected in the original CCC. The benefits of staff group leader mentoring and the interaction between branches during CAS³ were considered too valuable.

Reserve Component (RC) CPT PME. Currently, most RC officers attend the FAOAC-RC via Army correspondence courses and one two-week active duty for training (ADT) followed by CAS³ via correspondence courses, eight inactive duty for training (IDTs) and one two-week ADT. Too many of our ARNG captains, the majority of our branch captains, can't attend the resident CCC. It's difficult for them to be released from their civilian jobs for the 18-week course.

However, FAOAC-RC has some serious limitations. It consists of 17 Army Correspondence Course Program (ACCP) courses (about two weeks of instruction) and a two-week ADT. Officers are expected to work through the correspondence courses on their own and report to the FA School well prepared for ADT. However, the corre-

spondence program developed in 1927 is obsolete and, overall, of limited training value, and the course instructional hours are not comparable to FACCC.

Historically, officers arriving at Fort Sill for the two-week ADT are not well prepared and require a significant amount of refresher training. This additional training has turned the two-week ADT into a two-week-long “fire hose” of information. The FAOAC-RC is not an optimal learning experience, especially for branch transfers not well versed in FA fundamentals.

The FA School is designing instruction to rectify the FAOAC-RC limita-

tions and support TRADOC’s RC CPT PME. The RC CPT PME has three parts. Phase I is a nonresident part that is the approximate equivalent to 16 weeks of FACCC instruction. Phase II is a two-week ADT followed by unit annual training (AT). Finally, the staff process (CAS³) is covered in eight IDTs and a two-week ADT during Phase III.

FACCC via Distance Learning. The FA School is developing the FACCC-distance learning (FACCC-DL) for Phases I and II of the proposed RC CPT PME. The FACCC-DL strategy is based on a hierarchy of learning (see Figure 2). The course will consist of “asynchro-

nous,” “synchronous” and resident instruction. Asynchronous instruction will use communications technologies, such as e-mail, multi-media databases and virtual libraries, and be performed at the officer’s own pace and location.

Synchronous instruction will focus on communications technologies, such as desktop video conferencing and interactive group video conferencing, and will enable live, real-time interaction between instructors and learners. In essence, synchronous instruction will allow students to fall in with an instructor online and will be scheduled during IDT weekends.

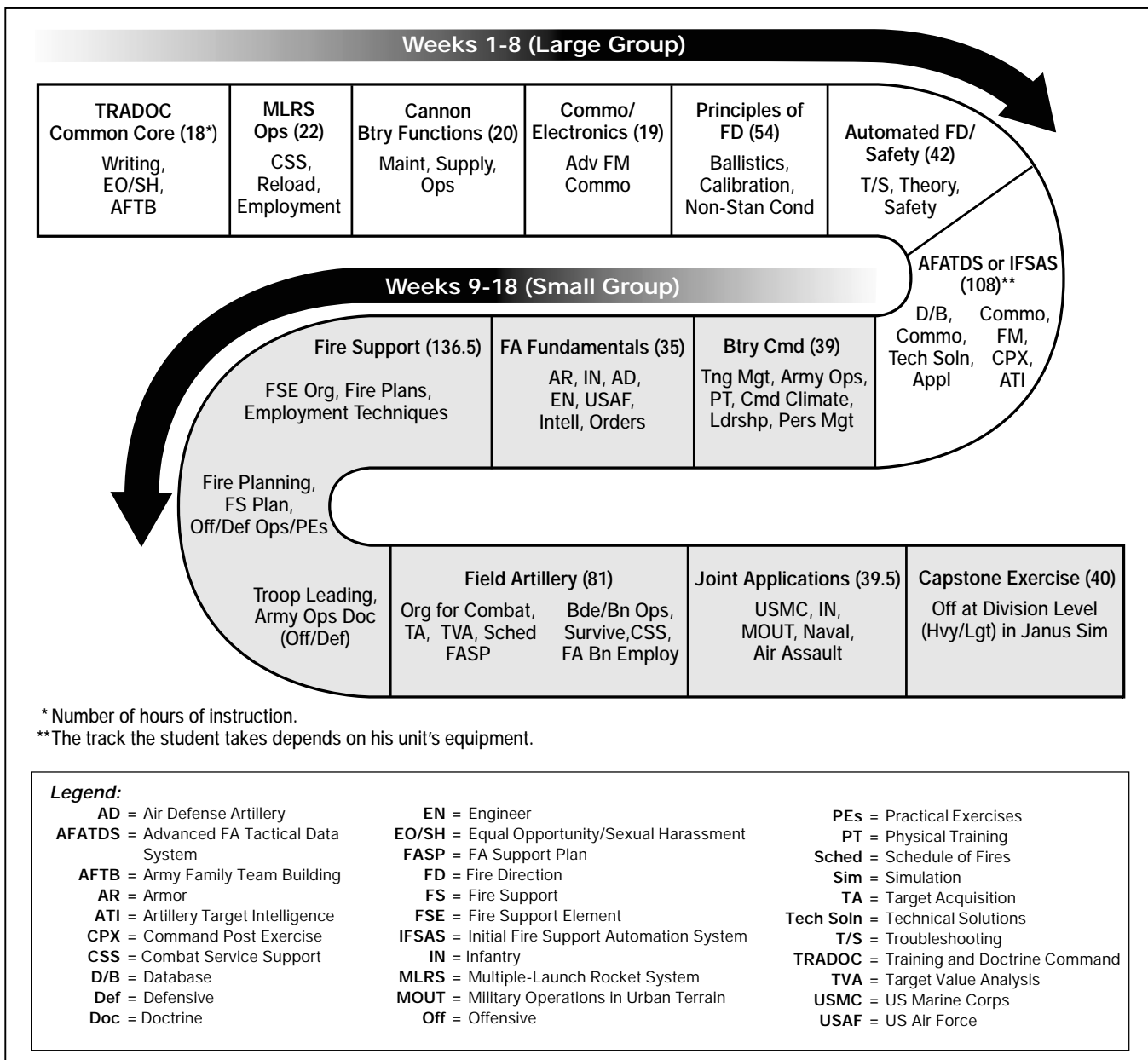


Figure 1: Resident FA Captains Career Course (FACCC) Program of Instruction (POI) Road Map. The resident FACCC instructional contents include 654 hours and take 18 weeks to complete. This road map is current with the exception of the AFATDS and IFSAS separate instruction tracking that will be implemented in FY01.

Year 1	Year 2	
Phase Ia	Phase Ib	Phase II
Asynchronous <ul style="list-style-type: none"> • Internet-Delivered • CD ROM • Instructor in the Loop • Student Drills with Unit 	Synchronous <ul style="list-style-type: none"> • IDT Weekends • Internet-Delivered • Student Drills with Unit Asynchronous <ul style="list-style-type: none"> • Internet-Delivered • CD ROM • Instructor in the Loop 	Resident <ul style="list-style-type: none"> • Two-Week ADT • CPX • Janus Simulation
Legend: ADT = Active Duty Training CPX = Command Post Exercise IDT = Inactive Duty Training		

Figure 2: FACCC-Distance Learning Strategy. The figure outlines two years of the FACCC-DL strategy. During year three, the student trains in ADT with his unit. He then learns his staff process in eight IDTs and a two-week ADT to complete the non-resident Captains Professional Military Education (CPT PME). FACCC-DL begins implementation in FY01.

Both methods of instruction will use web-based, Internet-delivered methodologies with an FA small group leader (SGL) in the loop to monitor student progress, provide assistance and answer students' questions. FACCC-DL will culminate with a two-week ADT resident phase at Fort Sill, focusing on application-driven exercises.

The FACCC-DL instructional content with associated hours is shown in Figure 3 and parallels the strategy outlined in Figure 2.

Phase Ia asynchronous instruction will consist of approximately 220.5 POI hours, equating to 4.6 hours per week for 48 weeks during the first training year. Automation instruction, IFSAS vice AFATDS, will depend on a unit's system and focus on the foundations, capabilities and limitations, but not the

operation of the system, which requires extensive practical exercises to develop proficiency. Those officers requiring specialized instruction, such as for a battalion fire direction officer (FDO) tour, may attend a two-week functional course at the FA School.

Phase Ib consists of approximately 105.5 hours of synchronous and 34 hours of asynchronous instruction during the first six months of the second training year. This phase will focus on the FACCC small group instruction associated with the FA and fire support blocks. Synchronous instruction will use six IDT weekends (one per month) with asynchronous instruction occurring simultaneously (1.4 hours per week for 24 weeks). The FA School will try to schedule the training for the third or fourth weekend of each month so ARNG

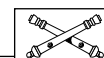
officers will be able to drill with their units.

Phase II ADT resident instruction (two weeks) will be scheduled during the last six months of the second training year. Based on historical data, four ADTs may be required to satisfy the annual student input.

The timeline for FACCC-DL implementation takes into account the transition from the current FAOAC-RC to FACCC-DL. Enrollment will end for FAOAC-RC on FY01 (October 2000); students already enrolled will be allowed to complete the instructional requirements until September 2001. FACCC-DL will start implementation in FY01 with the transition completed in FY02.

FACCC-DL will be more intensive and challenging than the current FAOAC-RC and will produce a more technically and tactically trained officer. An additional "return on the investment" is that personnel in the field will be able to use the web-based instruction for sustainment/refresher training as well as for the self-development pillar of the officer professional development process.

As the FA School moves toward the new millennium, the technology-based teaching strategy associated with the FACCC-DL breaks with traditional pedagogy and adopts an approach in sync with the cutting edge of technology.

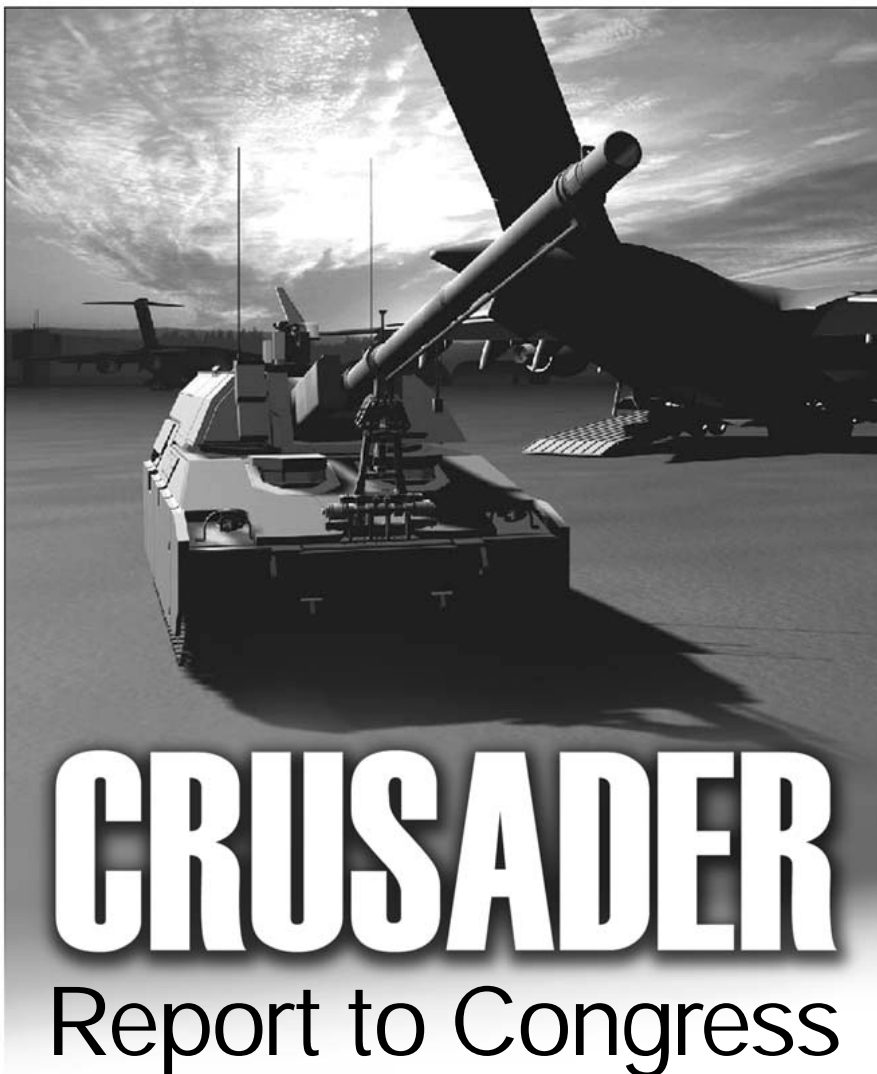


Major David W. Cavitt is the Senior Title XI Officer in the Integration Division of the Warfighting Integration and Development Directorate (WIDD) at the FA School, Fort Sill, Oklahoma. Previous assignments include serving as Combat Arms Branch Chief and FA Team Chief for the Readiness Group Redstone at Huntsville, Alabama, and S3 of the 4th Battalion, 82d Field Artillery and Operations Officer for the 42d Field Artillery Brigade, both at Fort Polk, Louisiana. He commanded a battery, part in the 4th Battalion, 18th Field Artillery, 41st FA Brigade, V Corps, in Germany.

Melvin R. Hunt is an Operations Research Analyst in the Integration Division of WIDD at the Field Artillery School. He has been employed with the Federal Government for 18 years, serving the past eight years as an Officer Education System (OES) Program Manager and is recognized as a Total Army Quality Assurance Evaluator in the Training and Doctrine Command (TRADOC) Training Evaluation and Quality Assurance Program. Mr. Hunt is a graduate of the Operations Research Systems Analysis Military Application Courses I and II.

Phase Ia*	Phase Ib	Phase II
Asynchronous (220.5**) <ul style="list-style-type: none"> • TRADOC Common Core (2) • MLRS or Cannon Btry *** (42) • Commo/Electronics (12) • Principles of FD (46) • Automated FD/Safety (36) • IFSAS or AFATDS *** (10) • Battery Command (27) • FA Fundamentals (30) • Joint Applications (15.5) 	Synchronous (105.5) <ul style="list-style-type: none"> • Fire Support (57.5) • Field Artillery (48) Asynchronous (34) <ul style="list-style-type: none"> • Fire Support (13) • Field Artillery (21) 	Resident (120) <ul style="list-style-type: none"> • Diagnostic Test • Gunnery Department CPX (12) • TF Ops/Military Decision-Making Process (36) <ul style="list-style-type: none"> - Top-Down Fire Planning - Fire Support Plan • FA Support Plan (32) • Capstone Exercise (40)
* The student cannot proceed to subsequent phases until cleared by the instructor. ** Number of hours of instruction. *** The student tracks to one or the other, depending on his unit's equipment.		

Figure 3: FACCC-DL Course Contents. This figure parallels the learning strategy outlined in Figure 2. These phases of the course include 480 hours of instruction completed in two years.



CRUSADER

Report to Congress

by Major Donald L. Barnett

The Strom Thurman National Defense Authorization Act for Fiscal Year 1999 directed the Army address specific issues for its major acquisition programs, one of which was Crusader. In response, the Office of the Project Manager-Crusader, the Training and Doctrine Command (TRADOC) System Manager for Cannons along with many government and industry experts wrote a report titled "Crusader, A Report to the Congressional Defense Committees" that was presented to the committees in February.

This article is taken from that 65-page report, discussing Crusader's capabilities and five issues Congress specified be addressed. The congressional committees accepted the report without further comments, questions or review.

Overview. The Army must have Crusader to fight and win successfully on future battlefields. Crusader, projected

for fielding on or about 2006, provides major enhancements to essential warfighting capabilities required to fully implement the operational concepts of Joint Vision 2010.

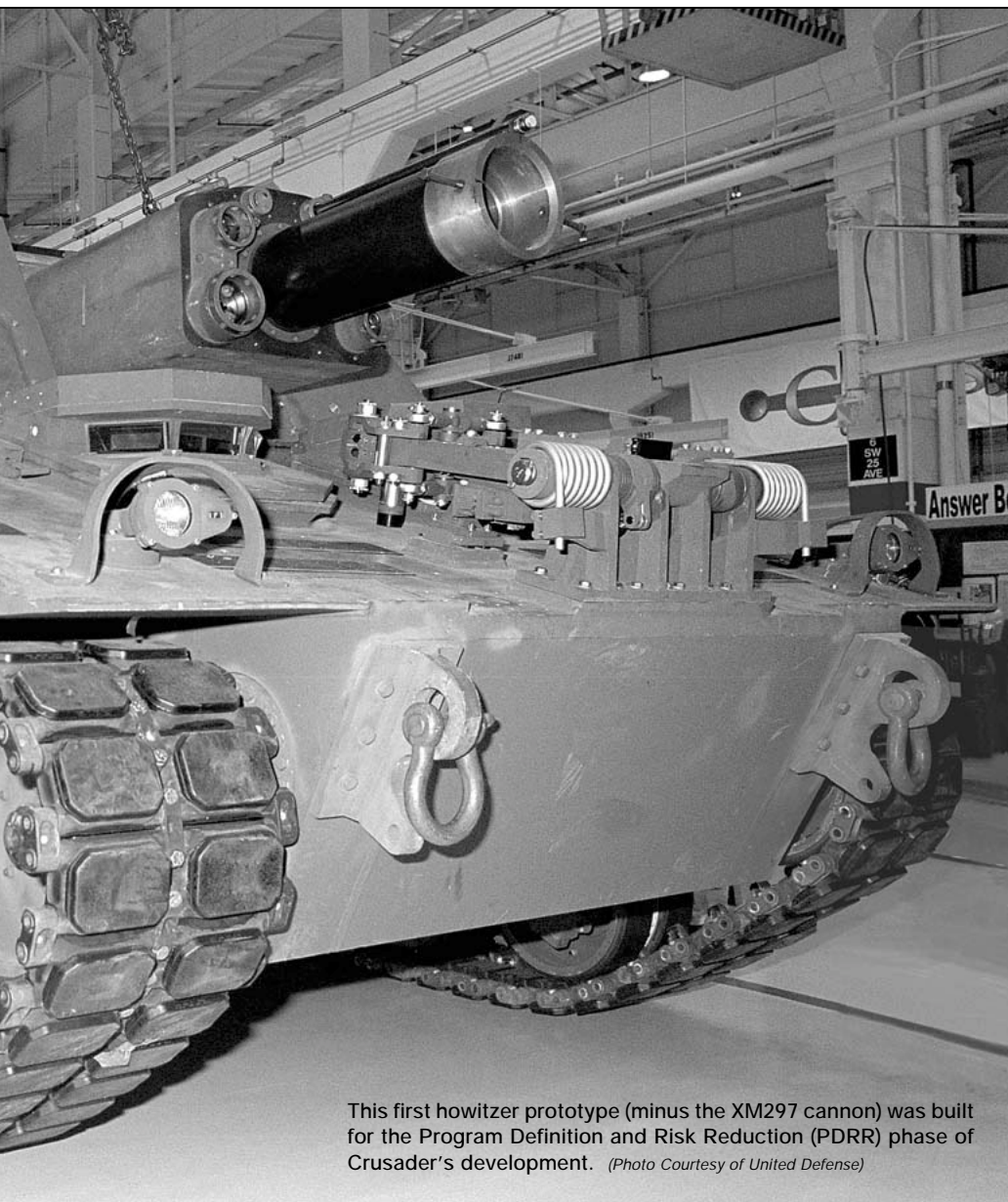
Crusader is the first US howitzer since World War II to give the US FA an overmatch capability, and it enables an overall force effectiveness increase of more than 50 percent.¹ To accomplish



this dramatic increase in effectiveness, the Crusader system leverages digital responsiveness, rate of fire, automated resupply, range and precision fires.

Crusader increases force survivability and tactical mobility, providing an umbrella of protection to the maneuver force that improves force survivability by 30 percent or more.² It enhances strategic deployment by providing a much smaller, more capable early entry fire support force enabled by Crusader's increased effectiveness.³

Crusader reduces manpower and support requirements, increases system reliability and decreases rounds required per kill—all of which contribute to lowering the warfighting logistical burden of cannon artillery fire support by 25 percent or more.⁴



This first howitzer prototype (minus the XM297 cannon) was built for the Program Definition and Risk Reduction (PDRR) phase of Crusader's development. (Photo Courtesy of United Defense)

Crusader frees the maneuver force from its former slower FA support. The combined arms force no longer is constrained to operate within the performance envelope of a howitzer designed in the 1950s.

This unleashing of maneuver power is based on two capabilities of Crusader: its speed and responsiveness, whether moving or emplaced. For the first time, the maneuver force has a howitzer that can move at the same or greater speed than the Abrams tank and Bradley fighting vehicle and can rapidly respond with more firepower for targets of opportunity during a battle. One Crusader howitzer can deliver up to eight rounds that land simultaneously on a target, a performance requiring eight M109A6 Paladin howitzers.

The future warfighting implications of information dominance and our vastly improved fire support are best illustrated by the results of the 1997 Division XXI Advanced Warfighting experiment (AWE) with the 4th Infantry Division (Mechanized) at Fort Hood, Texas. The AWE was a two-sided war-game with a "world-class" fully modernized combined arms army as the division's opposing force (OPFOR). In this AWE, Division XXI commanders

used advanced targeting systems, long-range fires and trapping and kill zone tactics to decimate OPFOR units. Crusader, with sense and destroy armor (SADARM) smart munitions and precision fires, was instrumental in the division's success.

In the AWE, operation plans were built using a system-of-systems approach to maximize warfighting abilities to "find, fix and kill" the enemy. Crusader was a key enabler of that concept, a concept that allowed commanders to shape the battlefield and set the conditions for total mission accomplishment. Effects, not forces, were massed in the AWE to achieve maneuver dominance and precision strike. Crusader-enabled combined arms forces are instrumental capabilities of the Army XXI mechanized division design.

Crusader is applicable across the full spectrum of Army operations. Many future missions will be military operations other than war (MOOTW) that have the potential for escalating into direct conflict. Crusader clearly fits well in MOOTW missions where small units are dispersed over large areas with an accompanying concern for "mission creep." Crusader provides speed of engagement, coverage over an area more than twice that of current howitzers, high accuracy to offset the dangers of collateral damage in an MOOTW environment, high survivability, great mobility and availability 24-hours a day in all weather conditions.

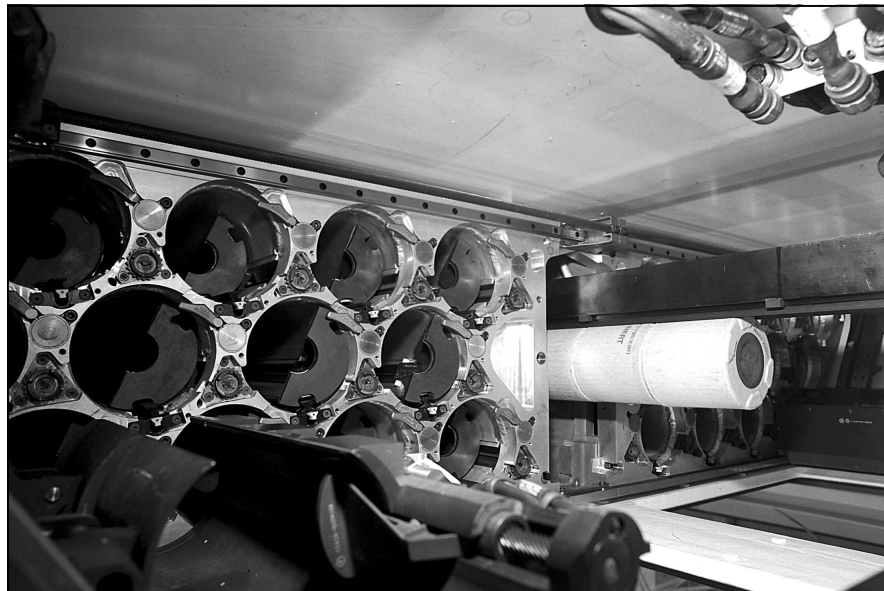
Crusader responds to the strategic deployment requirements of a power projection Army first and foremost by its quantum improvement in combat capability per system—an improvement so large that fewer systems and, thus, less lift are required to deploy an equivalent or greater fire support capability.

Crusader is air transportable in both the C5 and C17 aircraft to any theater worldwide for any mission needing fire support. A Crusader combat package of two howitzers, their resupply vehicles and ammunition provides the firepower equivalent of a six-gun battery of 155-mm Paladins but uses only 55 percent of the C5 sorties needed for the Paladins.

"A Crusader combat package of two howitzers, their resupply vehicles and ammunition provides the firepower equivalent of a six-gun battery of 155-mm Paladins but uses only 55 percent of the C5 sorties needed for the Paladins."

Crusader is the carrier vehicle for many technologies for the 21st century. Crusader provides unprecedented capabilities to Field Artillery through the incorporation of state-of-the-art technologies that are applicable to the Army at large. It incorporates in a production ground combat vehicle a three-man crew cockpit; fully automated ammunition handling, loading and firing; lightweight composite armor; integrated protection technologies; open software and electronics architecture; decision aids and diagnostics/prognostics; and many more advanced technologies that will be used in other future combat vehicle systems. (See the figure for many of Crusader's advanced technology features.)

The General Accounting Office reported that "developing and integrating the Crusader system to meet all the Army's requirements...depends heavily on the accomplishment of many technological firsts for US FA systems." That is precisely what's required to provide the Army the unprecedented capabilities it seeks in Crusader. However, in its development process, the program has demonstrated the ability to assess and manage inherent risks with a risk management program among the best in the Department of Defense (DoD).⁵



Above: Propellant magazines, part of the automated ammunition handling and loading system of the Crusader howitzer. Below: The resupply vehicle (minus ammunition handling equipment) is the first of the Crusader system prototypes and will be used for mobility testing. It "rolled out" 27 July. (Photo Courtesy of United Defense)

Crusader's anticipated affordability should be viewed from three perspectives: the cost to procure the system; the cost to man, operate and sustain it over its operational life; and the value of the system as a component of the Army's overall modernization program. Through a continuing balance of warfighting capabilities, technical solutions and costs in the cost-as-an-independent-variable (CAIV) process, the Army has been able to reduce Crusader's acquisition cost by more than 30 percent,⁶ achieving more than \$6 billion in savings and cost-avoidance since the program's inception. Equally remarkable, its ownership costs are projected to be 15 percent less⁷ than those of its predecessor.

Since its inception, the Army has determined that Crusader is of sufficient priority to warrant full funding in each annual budget submitted to Congress. Crusader is "the backbone" of the Army's confidence in its ability to dominate the close fight in concert with Joint Vision 2010—the program carries that priority. The unprecedented capabilities provided by Crusader demand that it be fully funded, and the Army has, without fail, shown its commitment to do just that.

Crusader is crucial to the success of Army XXI and is a key component of the Army 2010 and beyond. Designed from its inception to operate on the digitized battlefield of the next millen-



nium, Crusader provides the technologies for and the technical bridge into the 21st century. Crusader capabilities will fill an urgent warfighting need and change the way the Army fights.

Issue 1: Risk Assessment. "The report shall include...an assessment of the risks associated with the current Crusader program technology."

Short Answer: No major weapon system development program is risk free. The Crusader program has an appropriate amount of risk to deliver a system that satisfies an unprecedented set of performance requirements. The performance capabilities we require are driving the incorporation of many technological "firsts" for a Field Artillery system.

Currently, the only high-risk area is software. To assess and mitigate this and other risk areas, the Crusader program has one of the most comprehensive, aggressive and complete risk-management programs in DoD.⁸ The program has aggressively reduced risk over time and is on track to achieve its goal of reducing all technical risk areas to

Firepower

- Cannon Thermal Management (Cooling) System
- Automated Ammunition Selection, Loading, Ramming and Firing
- Automated Vehicle Docking (Transfer Ammunition and Fuel)

Mobility and Hull

- Drive-by-Wire
- Advanced Composite Armor
- Advanced Suspension and Track

Survivability

- Crew and Ammunition Compartmentalization
- Remotely Operated Defensive Armament
- Fire Suppression "Pow der Packs"

Software

- On-Board Technical and Tactical Fire Control
- Automated Decision Aids
- Embedded Training and Maintenance Diagnostics

Crusader Advanced Technology Features

moderate or lower before entering the next acquisition phase.

Issue 2: Crusader Fielding Requirements. “The report shall include...the total requirements for the Crusader system, taking into consideration revisions in force structure resulting from the redesign of heavy and light divisions to achieve a force structure known as the Army After Next” (AAN).

Short Answer: The Army acquisition objective for Crusader is 1,282 systems (1,282 self-propelled howitzers and 1,282 resupply vehicles) that would modernize the self-propelled cannon artillery force. The Army procurement objective for Crusader of 1,138 is fully funded in the FY00 budget submission and would field 22 Active Component (AC) FA battalions, 26 Army National Guard (ARNG) battalions, eight prepositioned sets (APS) and the training and logistics base.

The Crusader system performance characteristics are key enablers of the expected combined arms firepower of the Army XXI Division. Crusader performance expectations already have generated the early downsizing decision of the artillery structure by 878 howitzers and 22 percent of the Cannoneers. This was done with the knowledge that it places the force at risk in the near term but allows the Army to capitalize on its investment.

Crusader is a technology carrier for future land systems and will be able to take advantage of future weapons improvements. The system is a critical element of the future Army force structure in both Army XXI and the Army After Next (now known as “2010 and Beyond”). Although we know AAN will be equipped with a hybrid mix of product-improved current systems, modernized systems and future systems, the Army After Next force structure has not yet been determined; therefore, the total requirement for Crusader based on an AAN force structure also has not been determined.

Issue 3: Reduce the Weight. “The report shall include...the potential for reducing the weight of the Crusader system by as much as 50 percent.”

Short Answer: The Crusader system is strategically deployable by existing air, sea, rail and highway transport assets, and its strategic availability will increase with programmed improvements to strategic deployment resources.

The primary means of deploying Crusader is the same as the entire mecha-

nized force: shipping them or deploying their personnel to prepositioned stocks. Crusader is deployable in both the C5B and C17 aircraft. The size of the C17 high-load floor precludes deploying more than one self-propelled howitzer or one resupply vehicle at a time, regardless of the weight. The C5B can lift a complete Crusader system (one howitzer and resupply vehicle) at a time with a waiver.

Deploying the highly mobile Crusader into a theater provides significantly greater firepower and survivability—a viable early entry force multiplier. A Crusader *battery* out performs the current 155-mm *battalion*, meaning the force needs fewer sorties for more artillery capabilities.

It is not feasible now or in the foreseeable future to develop a cannon artillery system capable of delivering the minimum required performance weighing less than 50 percent of Crusader’s required weight of 55 tons.

Issue 4: Alternative Propellants. “The report shall include...the potential for using alternative propellants for the artillery projectile for the Crusader system and the effects on the overall program schedule that would result from taking the actions and time necessary to develop mature technologies for alternative propellants.”

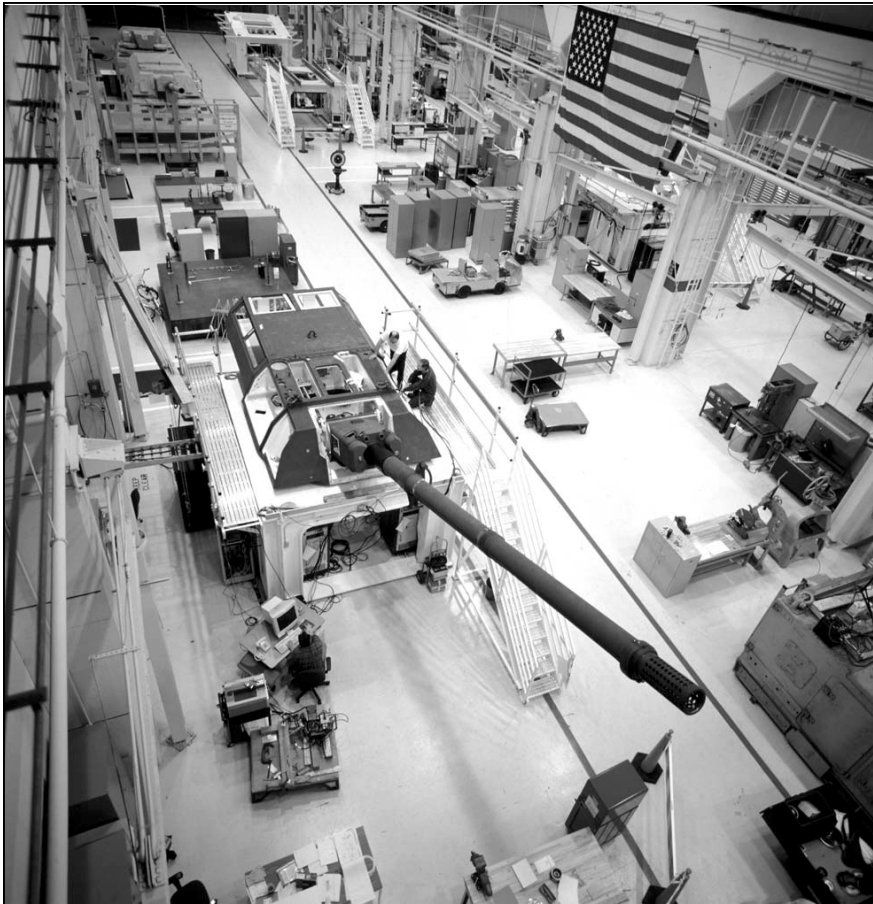
Short Answer: The modular artillery charge system (MACS) is the most advanced artillery propellant system in the world today and a significant improvement over the current bag charge propellant used in other 155-mm cannon systems. The MACS, together with Crusader’s XM297 cannon, comprise the most advanced artillery armament system current technology will allow. No other system in existence or in advanced development can match the Crusader armament in overall system performance.

As testing progressed in the 90s, it became apparent that liquid propellant technology was a long way from realization and that the projected benefits did not differ significantly from MACS. The MACS propellant supports the Crusader’s multiple-round simultaneous impact (MRSI) capability. MRSI is the Crusader howitzer’s ability to fire a four- to eight-round mission with the rounds’ impacting simultaneously on the same target and is the most revolutionary capability the system brings to the battle.

Current candidate technologies for a future propellant, if successfully developed, would offer only marginal—not revolutionary—performance improvements over MACS, with fielding possible no earlier than 2015, a nine-year



Specialist Timothy Hicks, B Battery, 3d Battalion, 18th Field Artillery, III Corps Artillery, practices loading the new M232 propellant during phase two testing of the modular artillery charge system (MACS). (Photo by SSG Robert Edwards, Fort Sill Cannoneer)



The first prototype howitzer in the Systems Integration Facility (SIF), United Defense, Minneapolis, Minnesota. (Photo Courtesy of United Defense)

delay in the schedule. The Army is continuing to evaluate alternative propellants for possible use in a future product improvement of the Crusader system.

Issue 5: Cost-Benefit Delay Analysis "The report shall include...an analysis of the costs and benefits of delaying procurement of the Crusader system to avoid affordability issues associated with the current schedule and to allow for maturation of weight and propellant technologies."

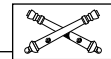
Short Answer: Analyses reveal that delaying the procurement of the Crusader

system would result in significant increases in program cost and warfighting risk with no significant warfighting benefit. Delaying the program 10 years to insert emerging technologies could cost the Army as much as \$5.6 billion (FY98 constant dollars) but would provide negligible return in terms of improved combat effectiveness or strategic deployability.⁹ The delay would prolong US inferiority in cannon fire support and continue to place the force at risk while waiting for Crusader's availability.

The Crusader cost per system has continually gone down from an initial Cru-

sader Program Management Office estimate of more than \$16 million per system (howitzer and resupply vehicle) to less than \$11 million—a 34 percent reduction in unit cost. Crusader also decreases ownership costs by reducing the manpower requirements, the greatest contributor to system life-cycle costs. The system's automation has resulted in a 33 percent reduction in the size of the howitzer section crew, which equates to more than \$2.4 billion in military personnel savings over 20 years.

Crusader is a key component of the Army's acquisition strategy. The Army continually has chosen to fully fund Crusader because it is uniquely essential to the warfighting needs of the future force. The Army's Division XXI performance requires Crusader; Army XXI cannot meet Joint Vision 2010 objectives without it.



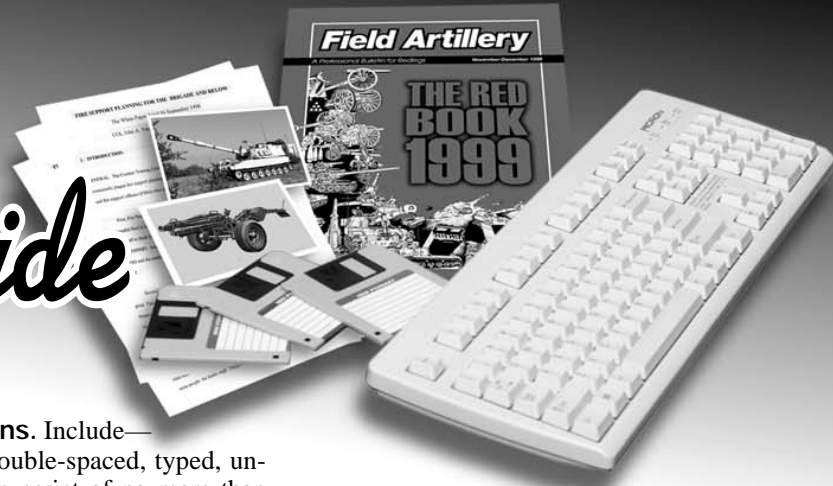
Major Donald L. Barnett is an Assistant Training and Doctrine Command Systems Manager for Cannons (TSM-Cannon) as a Crusader Combat Development Staff Officer at the Field Artillery School, Fort Sill, Oklahoma. In his previous assignment, he was a Doctrine Author on the Division Team in the Combined Arms and Doctrine Directorate of the Command and General Staff College, Fort Leavenworth, Kansas. He also served as a Brigade S3 and Brigade Fire Support Officer (FSO) Observer/Controller (O/C) for the National Training Center's (NTC's) Live-Fire Operations at Fort Irwin, California. His other O/C experience includes serving as a Combat Service Support Trainer for the Fire Support Division at the NTC. In addition, he was the Battalion FSO for the 1st Battalion, 69th Armor and 4th Battalion, 66th Armor in the 3d Infantry Division (Mechanized), Germany. Major Barnett commanded Service Battery, 5th Battalion, 18th Field Artillery, part of the 75th Field Artillery Brigade in III Corps Artillery at Fort Sill.

Endnotes:

1. The percentage is based on various operational effectiveness analyses, including the "Crusader Cost and Operational Effectiveness Analysis" conducted by the US Army Training and Doctrine Command (TRADOC) Analysis Center, 1994 and 1996, and the "Crusader Force and System Effectiveness Analyses" conducted by Vector Research, Inc., for the Project Manager Crusader, 1996 and 1997.
2. Ibid.
3. Ibid.
4. "Crusader Logistics Resupply Analysis" conducted by the US Army Materiel and Systems Analysis Activity, February 1998.
5. The US Army Materiel and Systems Analysis Activity periodically conducts an independent assessment of Crusader's schedule and performance risks and reviews the program's risk mitigation plans. Based on the results of a number of such independent reviews since the Crusader Milestone I decision in November 1994, AMSAA reports "[The] Crusader program has a very comprehensive, aggressive and complete risk assessment program."

6. "Crusader Evidence of Compliance Report" conducted by Office of the Project Manager-Crusader for the Army Cost Reduction and Reinvestment Initiative, February 1997.
7. "Crusader Milestone I Cost and Operational Effectiveness Analysis, Cost Report," conducted by Training and Doctrine Command Analysis Center, July 1994.
8. The results of US Army Materiel and Systems Analysis Activity independent assessments of Crusader's schedule and performance risks and reviews of risk mitigation plans since November 1994: "[The] Crusader program has a very comprehensive, aggressive and complete risk assessment program."
9. The Army's Cost and Economic Analysis Center validated cost figures comparing the baseline cost of the current Crusader program and that of a "New Start" Crusader program: an increase for the New Start Crusader program of at least \$5.6 billion in FY98 constant dollars and \$11.1 billion in then-year dollars.

2000 Field Artillery Author's Guide



Readership. A bimonthly magazine, *Field Artillery* is the professional journal for US Army and Marine Corps Redlegs worldwide. Approximately 40 percent of our readership is company-grade, both officer and enlisted, with the remaining 60 percent more senior Army and Marine personnel, Department of Defense (DoD) civilians, retirees, members of other branches and services, allies, corporate executives and our political leaders. *Field Artillery's* web page is sill-www.army.mil/famag.

Subjects. The majority of the articles accepted cover subjects at the tactical level of war with some at the operational and strategic levels as long as their contents relate to Field Artillery or fire support or are of special interest to our readers.

If an author is writing about the past, he should analyze the events and show how they apply to Field Artillerymen today—not just record history. If he's identifying current problems, he must propose solutions. (An author may identify problems without proposing solutions only in a letter-to-the-editor.) In addressing the future, he should clearly explain his points and their implications.

Since its founding in 1911, one of *Field Artillery's* objectives has been to serve as a forum for professional discussions among the FA community. Therefore, an author's viewpoint, recommendations or procedures don't have to agree with those of the Branch, Army or DoD. But his article's contents must be logical and accurate, address disadvantages as well as advantages (as applicable), promote only safe techniques and procedures and include no classified information.

Articles must be clear and concise with the thesis statement (bottom line) up front and the body of the article systematically contributing to the thesis. When writing, authors must think like the Redleg in the field: "What is it?" "What will it do for me?" and "How do I implement it?" (or "When will I get it?"). *Field Artillery* has a theme for each edition, but we're not theme-bound. In most editions, we include articles not related to the theme.

Submissions. Include—

- A clean, double-spaced, typed, unpublished manuscript of no more than 5,000 words with footnotes and bibliography, as appropriate. Send a PC text formatted disk along with the hard copy of the manuscript. Except in the case of Army-wide "news" items, *an author should not submit a manuscript to Field Artillery while it's being considered elsewhere.*

- A comprehensive biography, highlighting experience, education and training relevant to the article's subject. Include email and mailing addresses and telephone and Fax numbers.

- Graphics with captions to illustrate and clarify the article. These can include photographs of any size (but preferably color/5x7-inch), drawings, slides, maps, charts, unit crests, etc. We accept digital photos saved at a *minimum* of 300 dpi.

1. *Shoot the digital picture.* Set the camera on the largest frame (minimum of 5x7 inches) and the highest resolution the digital camera will allow. We accept TIF or JPG files.

2. *Download the raw data.* Save the digital image in raw data. Do *not* manipulate the data (resize or try to edit the image). Don't try to enhance the small,

low-resolution photo you shot. For example, shooting an 800-kilobyte image and enhancing the dpi until the file size is 4 MB will *not* make it a clearer picture (just bigger dots, not more of them).

3. *Send us the digital file.* Do not resize a JPG photo to make it fit on a floppy disk. Our magazine's email will accept 5 MB or smaller per message. If the photos are large, send one at a time via email, each with a caption of who's doing what in that image, the name of the author and article it will illustrate.

If a file exceeds 5 MB, you can upload it on to the Fort Sill file transfer protocol (FTP) web site for us to pick up. Email or call us, and we'll tell you how to post your image on the FTP site.

Mail. *Field Artillery*, P.O. Box 33311, Fort Sill, Oklahoma 73503-0311 (Email: famag@doimex2.sill.army.mil).

We will edit all manuscripts and put them in our style and format. Authors will receive a "check copy" of the edited version before publication. If you have questions, call the editor at DSN 639-5121 or 6806; commercial (580) 442-5121 or 6806 or Fax 7773 that works with both prefixes.

Field Artillery Themes for 2000

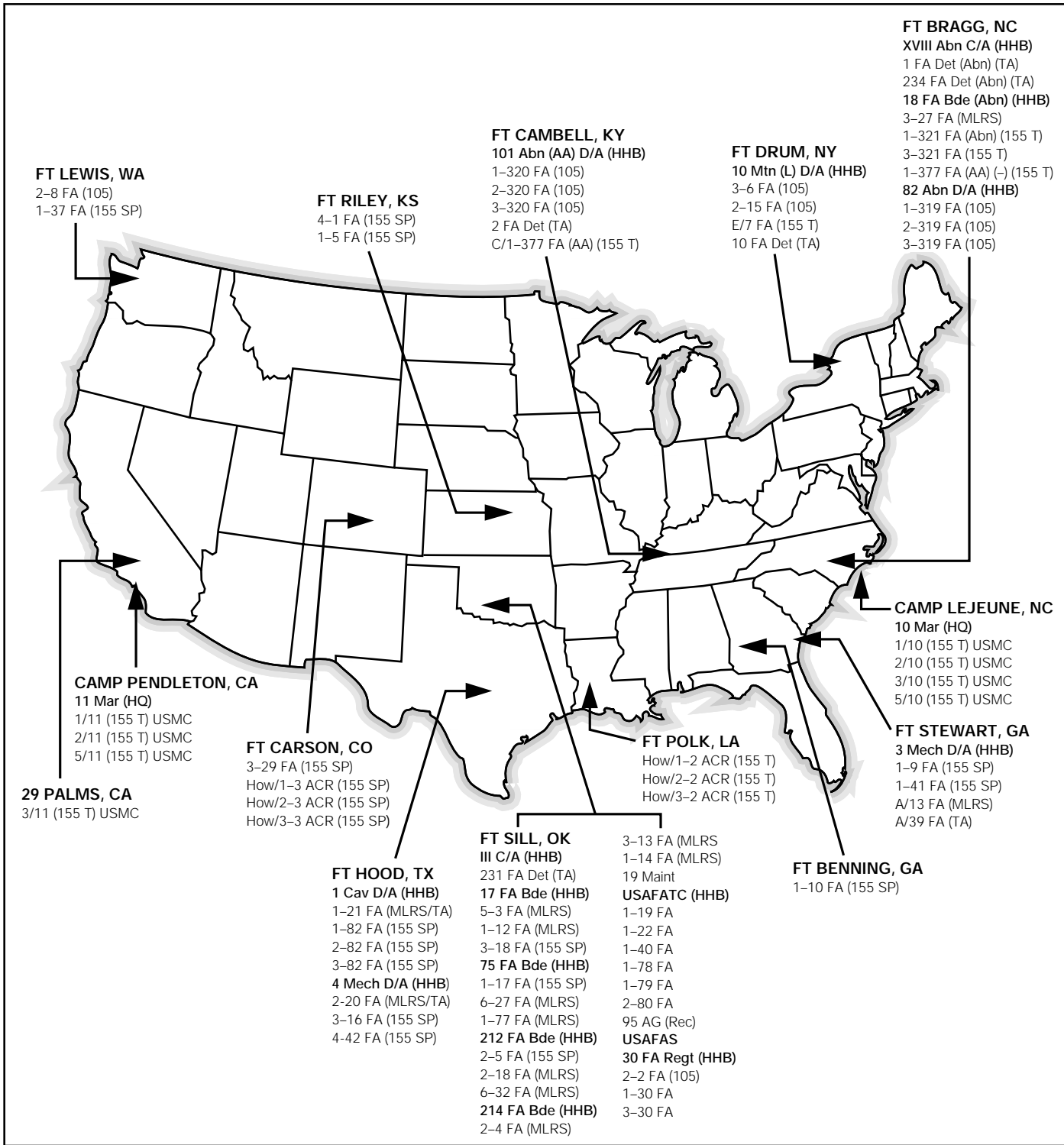
Edition	Theme	Deadline
Jan-Feb	World Fires	1 Oct 99
Mar-Apr	Training	1 Dec
May-Jun	A Day in the Life of...	1 Feb 00
Jul-Aug	History	1 Feb: Contest* 1 Apr: Other
Sep-Oct	Developing Adaptive Leaders	1 Jun
Nov-Dec	Red Book	1 Aug

*See the 2000 History Contest Rules in the July-August 1999 edition.



Active Army and Marine Units in CONUS

As of 1 November 1999





Active Army and Marine Units in OCONUS

As of 1 November 1999

Republic of Germany

- WIESBADEN**
V C/A (HHB)
- GIESSEN**
2-3 FA (155 SP)
- SCHWEINFURT**
1-7 FA (155 SP)
- BAMBERG**
1 Mech D/A (HHB)
1-6 FA (155 SP)
1-33 FA (MLRS/TA)
- BABENHAUSEN**
41 FA Bde (HHB)
1-27 FA (MLRS)
- BAUMHOLDER**
1st AR D/A (HHB)
4-27 FA (155 SP)
A/94 FA (MLRS)
C/25 FA (TA)

Italy

- VICENZA**
D/319 FA (105)

Okinawa

- CAMP HANSEN**
12 Mar (HQ)
3/12 (155 T) USMC

Hawaii

- KANEOHE BAY**
1/12 (155 T) USMC
- SCHOFIELD BARRACKS**
25 IN (L) D/A (HHB)
3-7 FA (105)
2-11 FA (105)
F/7 FA (155 T)
25 FA Det (TA)

Alaska

- FT WAINWRIGHT**
4-11 FA (-) (105)
- FT RICHARDSON**
C/4-11 FA (105)

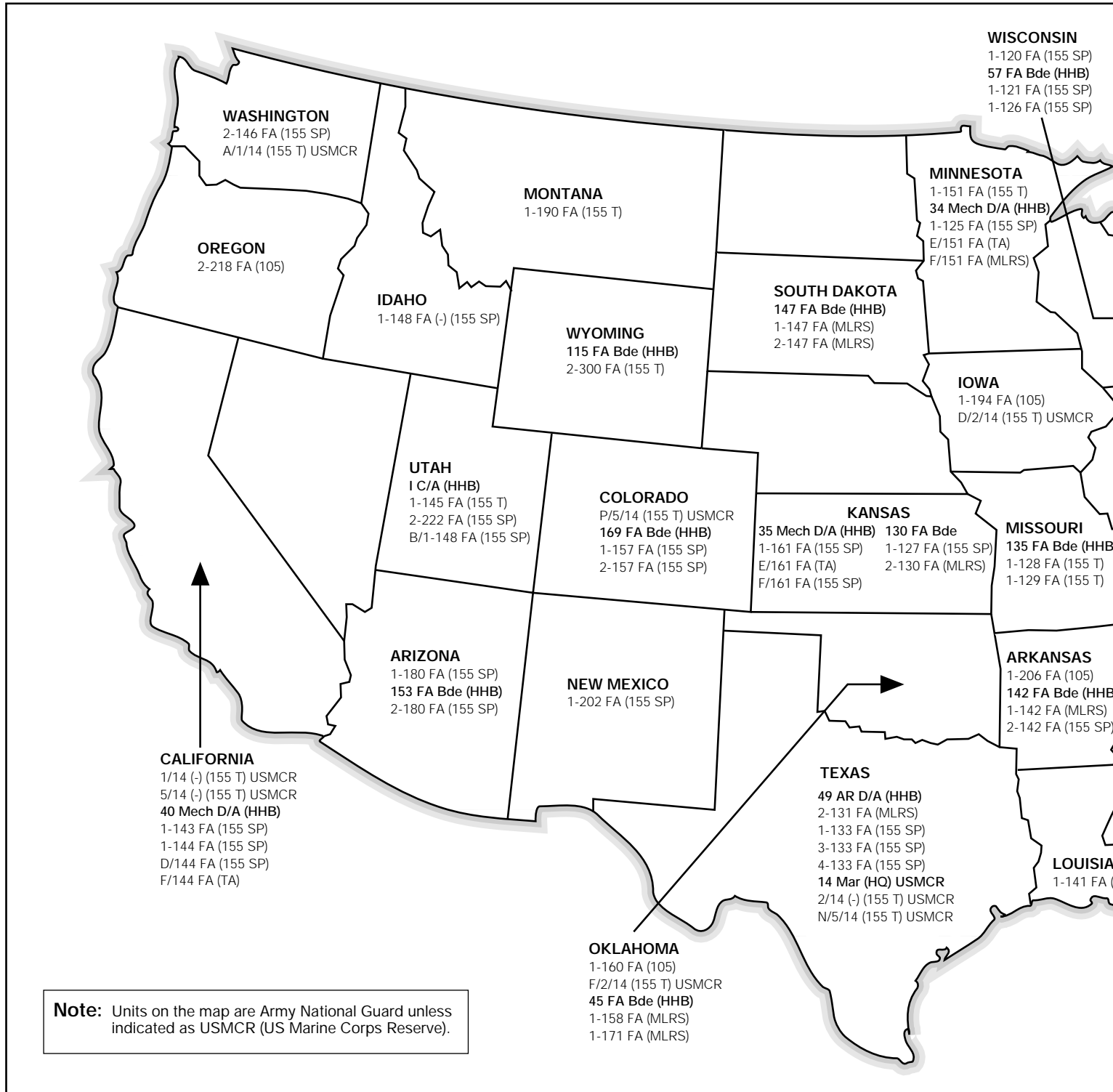
Republic of Korea

- CAMP HOVEY**
2-17 FA (155 SP)
- CAMP CASEY**
1-15 FA (155 SP)
- CAMP STANLEY**
2 IN D/A (HHB)
6-37 FA (MLRS)
F/26 FA (TA)
A/38 FA (MLRS)

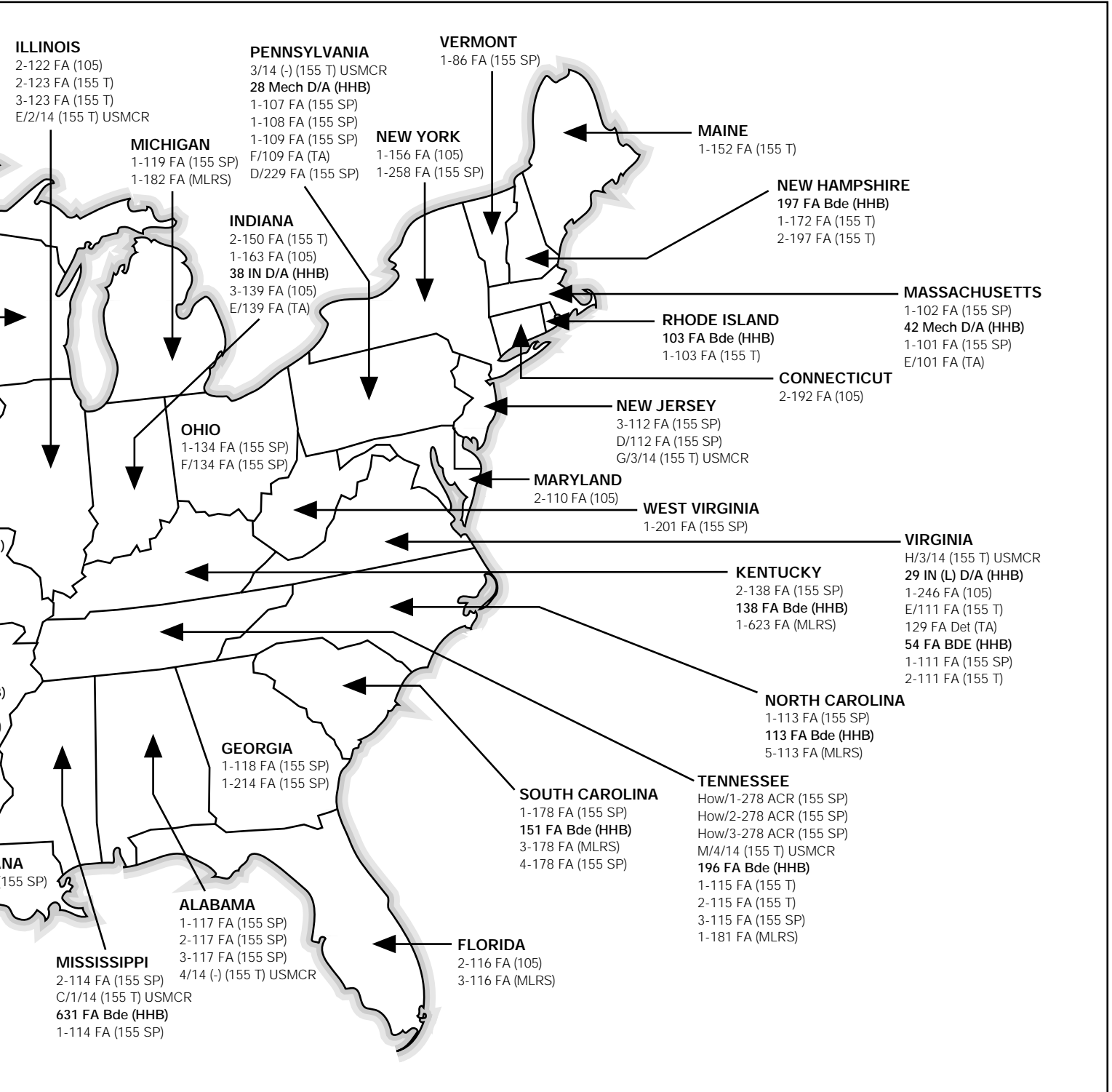
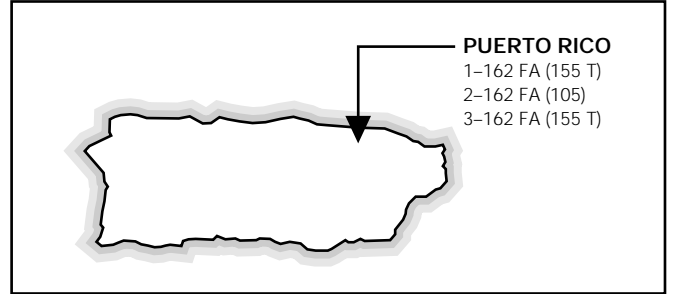
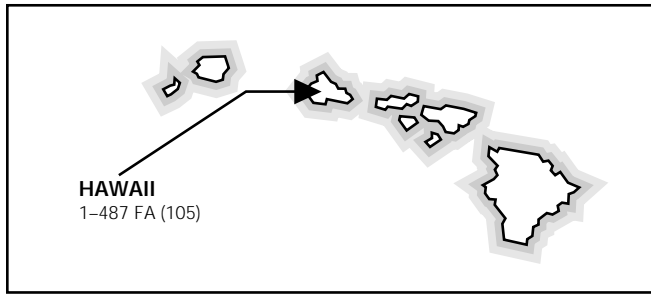


Army National Guard and Marine Reserves

As of 1 November 1999



Note: Units on the map are Army National Guard unless indicated as USMCR (US Marine Corps Reserve).





Field Artillery Commanders and Command Sergeants Major COMMAND UPDATE

As of 1 November 1999

Active Army

Training and Doctrine Command

US Army Field Artillery School and Fort Sill

MG Stricklin, Toney
Commandant/CG

CSM Williams, Anthony J.
Fort Sill

BG Engel, William F.
Asst Commandant

CSM Roberts, Perry L.
Trng Cmd

COL Janosko, Theodore J.
CSM Roberts, Perry L.
30th FA Regiment

LTC Enneking, David M.
CSM Walton, Larry
2d Bn, 2d FA

LTC Beaty, Reginal B.
CSM Kelly, John E., Jr.
1st Bn, 30th FA

LTC Haithcock, John L., Jr.
SGM Rodriguez, Wilson E.
3d Bn, 30th FA

COL Walsh, Gerard M.
CSM Drummond, Walter L.
FA Training Center

LTC DuRant, Brian D.
CSM Moyer, Jeffery L.
1st Bn, 19th FA

LTC Meyer, Jeffrey C.
CSM Thompson, Donald W.
1st Bn, 22d FA

LTC Wreford, David V.
CSM Torresleon, Jose C.
1st Bn, 40th FA

LTC Puckett, Anthony J.
CSM Reed, Morgan B.
1st Bn, 78th FA

LTC Byrd, Michael A.
CSM Phipps, Marlon B.
1st Bn, 79th FA

LTC Fulton, Christopher T.
CSM VasquezRosario, Enrique
2d Bn, 80th FA

LTC Henkel, Louis O.
CSM Mulvany, Ralph E.
95th AG Bn (Rec)

Forces Command

III Corps

BG Hartsell, Lynn
CSM Sturdivant, Lash L.
III Corps Arty

LTC(P) Oaksmith, Sidney G.
CSM Byrd, Willie L.
17th FA Bde

LTC Sullivan, Ricki L.
CSM Ramirez, Armando
5th Bn, 3d FA

LTC Agron, Gary A.
CSM Walker, Michael L.
1st Bn, 12th FA

LTC Lingenfelter, Michael D.
CSM Burks, William H., Jr.
3d Bn, 18th FA

COL Hampton, David R., Jr.
CSM Ashe, Robert T.
75th FA Bde

LTC Walker, Michael T.
CSM Parrish, George L.
1st Bn, 17th FA

LTC Davis, James L.
CSM Peterson, Willie L.
6th Bn, 27th FA

LTC Tillman, Mark E.
CSM Cotham, John A.
1st Bn, 77th FA

COL Willis, Colen K.
CSM Talley, Marty R.
212th FA Bde

LTC Crawford, Cardon B.
CSM Collins, Joseph
2d Bn, 5th FA

LTC Schneider, David A.
CSM Batts, Adner M.
2d Bn, 18th FA

LTC Smith, Stephen T.
CSM Wood, Eddie
6th Bn, 32d FA

COL Hall, Russell J.
CSM Stanley, Joseph W.
214th FA Bde

LTC Hought, David D.
CSM Record, Christopher L.
2d Bn, 4th FA

LTC Laski, Paul A.
CSM Williams, Albert R.
3d Bn, 13th FA

LTC Longo, Richard C.
CSM Bushue, William P.
1st Bn, 14th FA

LTC Clark, Mary J., OD
CSM Talley, Ricky J.
19th Maint Bn

XVIII Airborne Corps

BG Gottardi, Larry D.
CSM Thompson, Ronald
XVIII Abn Corps Arty

COL Vangjel, Peter M.
CSM Hand, Norris A.
18th FA Bde

LTC Gentry, Donald E.
CSM Stewart, Quenten M.
3d Bn, 27th FAR

LTC Mathis, James J.
CSM Towery, Ronald L.
1st Bn (Abn), 321st FA

LTC Yuengert, Louis G.
CSM Delaconcepcion, Melquiades
3d Bn, 321st FAR

LTC Schneider, Michael W.
CSM Friday, Ronald D.
1st Bn, 377th FAR (AAslt)

Division Artilleries

COL Hammond, Jeffery W.
CSM Schindler, Gerald R.
1st Cav Div Arty

LTC Reid, Carlton B., Jr.
CSM Ingram, Larry W.
1st Bn, 21st FA

LTC Bourque, Alan G.
CSM McMurtrie, Thomas O.
1st Bn, 82d FA

LTC Silvers, Jack D.
CSM Parker, Larry D.M.
2d Bn, 82d FA

LTC Batschelet, Allen W.
CSM Croley, Vern, III
3d Bn, 82d FA

COL Formica, Richard P.
CSM Nelson, Jerry
3d IN Div (Mech) Arty

LTC Gilliam, Walter L.
CSM Bryant, James A.
1st Bn, 9th FA

LTC Herold, Ernest J., III
CSM Porter, Ronnie
1st Bn, 10th FA

LTC Anderson, David S.
CSM Humphries, John L.
1st Bn, 41st FA

COL Hernandez, Rhett A.
CSM Shelly, Earl L.
4th IN Div (Mech) Arty

LTC Quigley, Brian F.
CSM Wyatt, Lazarus D.
3d Bn, 16th FA

LTC Herring, Gregory K.
CSM Sherrill, James A.
2d Bn, 20th FA

LTC Kelliher, Michael P.
CSM Speed, Cornelius W.
3d Bn, 29th FA

LTC Beckinger, Robert C.
CSM Howell, James M.
4th Bn, 42d FA

COL Bartell, Arthur M.
CSM Warren, James R., Jr.
10th Mtn Div (L) Arty

LTC Martino, David C.
CSM Carter, Billy D.
3d Bn, 6th FA

LTC Johnson, Samuel H.
CSM Beck, Rodney L.
2d Bn, 15th FA

COL Cerrone, James A.
CSM Taylor, Michael R.
82d Abn Div Arty

LTC Uberti, John
CSM Thompson, Alex G.
1st Bn, 319th AFAR

LTC Grymes, Robert D.
CSM Amacker, Wilfried W.
2d Bn, 319th AFAR

LTC Cannon, Michael M.
CSM Williams, Michael W.
3d Bn, 319th AFAR

COL Keefe, Daniel J.
CSM Shaw, Oscar
101st Abn Div (AAslt) Arty

LTC Crawford, Brian A.
CSM Dunham, Willie R.
1st Bn, 320th FA

LTC Worrell, Harold H., Jr.
CSM McLaurin, James S.
2d Bn, 320th FA

LTC Creighton, James L.
CSM Lewellen, Gary W.
3d Bn, 320th FA

Separate Units

LTC Barry, Robert F., II
CSM Donohue, Thomas J.
4th Bn, 1st FA
(1st AR Div Arty)

LTC Lanza, Stephen R.
CSM Mathurin, Winston E.
1st Bn, 5th FA
(1st IN Div (Mech) Arty)

LTC Ridge, Ross E.
CSM Roberts, Bruce D.
2d Bn, 8th FA
(25th IN Div (L) Arty)

LTC Vandal, Thomas S.
CSM Sanders, Ronald H.
1st Bn, 37th FA
(2d IN Div Arty)

US Army Europe

V Corps

COL Hayes, Michael T.
CSM Allen, John G.
V Corps Arty

COL Hayes, Michael T.
CSM King, Dennis M.
41st FA Bde

LTC Hennes, Mark M.
CSM Ellenburg, William L., Jr.
1st Bn, 27th FA

Division Artilleries

COL Nolan, Daniel A., III
CSM Canuela, Gilbert L.
1st AR Div Arty

LTC Brockman, Jonathan B.
CSM Dismuke, Thurman A.
2d Bn, 3d FA

LTC Hoy, James R., Jr.
CSM Delano, Douglas C.
4th Bn, 27th FA

COL Morgan, John W., III
CSM Castillo, Ivan A.
1st IN Div (Mech) Arty

LTC Stramara, Kevin P.
CSM Victorino, James P.
1st Bn, 6th FA

LTC Waring, James M.
CSM McPherson, Carl B.
1st Bn, 7th FA

LTC Snyder, Robert D.
CSM Finkle, Timothy M.
1st Bn, 33d FA

US Army Pacific

Division Artilleries

COL Halverson, David D.
CSM Wilson, Donald M.
2d IN Div Arty

LTC Robards, James A.
CSM Judie, Edward, Jr.
1st Bn, 15th FA

LTC Kinne, Gary S.
CSM Cabrera, Charles
2d Bn, 17th FA

LTC Perkins, Alvin A.
CSM White, David A.
6th Bn, 37th FA

COL Riojas, Jose D.
CSM Hopkins, Charles D.
25th IN Div (L) Arty

LTC Johnson, Robert C.
CSM Williams, Tommy A.
3d Bn, 7th FA

LTC Dahl, Kenneth R.
CSM Dunn, Gerald R.
2d Bn, 11th FA

Separate Unit

LTC Travas, Todd J.
CSM Chaves, Manuel F., Jr.
4th Bn, 11th FA
(172d Sep IN Bde)

Army National Guard

I Corps

BG Gordon, Stanley J.
CSM Walbeck, William B.
I Corps Arty

LTC Liechty, Michael R.
CSM Stone, Steven T.
1st Bn, 145th FA

LTC Christensen, Thomas R.
CSM Summers, Bruce D.
2d Bn, 222d FA

Brigades

COL Haub, Larry D.
CSM Bennett, Larry P.
45th FA Bde

LTC Roshell, Robert W.
CSM Jouret, James V.
1st Bn, 158th FA

LTC Moore, Glen E.
CSM Dacus, Galen A.
1st Bn, 171st FA

COL Young, John L. III
CSM Halfacre, Howard E.
54th FA Bde

LTC Batts, Frank E.
CSM Eacho, James E.
1st Bn, 111th FA

LTC Earhart, Douglas B.
CSM Frye, Zane D.
2d Bn, 111th FA

COL Schiller, James A.
CSM Shapiro, Marc O.
57th FA Bde

LTC Beyer, Steven A.
CSM Klug, Thomas D.
1st Bn, 121st FA

LTC Much, Bryan T.
CSM Gifford, James T.
1st Bn, 126th FA

COL Nuttall, James W.
CSM McDonough, John J., IV
103d FA Bde

LTC Rooney, Joseph E.
CSM Pereira, Armand M.
1st Bn, 103d FA

COL Newton, Joel B.
CSM Ingram, Larry G.
113th FA Bde

LTC Fitzpatrick, William F.
CSM Sampson, Richard M.
1st Bn, 102d FA

LTC Beard, Kenneth A.
CSM Daniels, Allen C., Jr.
5th Bn, 113th FA

COL Dunn, Gary J.
CSM Russell, Dennis R.
115th FA Bde

LTC Patterson, John W.
CSM Varner, Marvin S.
1st Bn, 190th FA

LTC Luce, Gerald G.
CSM Willis, James L.
2d Bn, 300th FA

LTC(P) Stewart, James M.
CSM Putman, Dale L.
130th FA Bde

LTC Wiker, David A.
CSM Althouse, Michael D.
1st Bn, 127th FA

LTC Duckworth, Alexander E.
CSM Bahr, Ronald E.
2d Bn, 130th FA

COL Wilson, George W.
CSM Rich, William B., II
135th FA Bde

LTC Polles, Timothy D.
CSM Carney, William J.
1st Bn, 128th FA

LTC Irwin, David F.
CSM Estes, Danny R.
1st Bn, 129th FA

COL Nicholas, Robert M.
CSM Pendleton, Thomas D.
138th FA Bde

LTC West, Billy J.
CSM Hoffman, William F.
1st Bn, 623d FA

COL Kimmey, Kim
CSM Fagala, Robin F.
142d FA Bde

LTC Hughes, Gerald S.
CSM Kelly, Clarence H.
1st Bn, 142d FA

LTC Montgomery, Jeffery W.
CSM Branch, Gary D.
2d Bn, 142d FA

COL Davies, James R.
CSM Hurney, Richard J.
147th FA Bde

LTC Hawley, Spencer L.
CSM Leonard, Thomas D.
1st Bn, 147th FA

LTC Michlitsch, Harvey A.
CSM Kotzea, Dale D.
2d Bn, 147th FA

COL Mabry, Buford S., Jr.
CSM Ward, Franklin P.
151st FA Bde

LTC Griese, James E.
CSM Herndon, Charles R.
3d Bn, 178th FA

LTC Pipkin, Roy P.
CSM Elliot, Eddie G.
4th Bn, 178th FA

COL Germain, David K.
CSM Lara, Ysabel S.
153d FA Bde

LTC Grayson, James E., Jr.
CSM Elifritz, James R.
2d Bn, 180th FA

COL O'Hara, Patrick M.
CSM Huskey, Rodney D.
169th FA Bde

LTC Beers, John K.
CSM Keppel, Kenton E.
1st Bn, 157th FA

LTC Loftus, Cory L.
CSM Collins, Richard M.
2d Bn, 157th FA

COL Greer, David E.
CSM McDaniel, John C., Jr.
196th FA Bde

LTC Harris, Robert A.
CSM Minter, Dwight F.
1st Bn, 115th FA

LTC Sipes, James T.
CSM Stevens, Barrett M.
2d Bn, 115th FA

LTC Geren, Joe C., Jr.
CSM Turner, William B., Jr.
3d Bn, 115th FA

LTC Wallace, C. Doug
CSM Gentry, Gary J.
1st Bn, 181st FA

COL Aubin, John P.
CSM Crotto, Gregory H.
197th FA Bde

LTC Madison, Michael J.
CSM Canavan, Michael J.
1st Bn, 172d FA

LTC Dupuis, Donald R.
CSM Starr, John D.
2d Bn, 197th FA

COL Pierce, Billy L.
CSM Cowley, Gerald R.
631st FA Bde

LTC May, William R.
CSM Cummins, Anclé W.
1st Bn, 114th FA

LTC Andrews, Curtis W.
CSM Jackson, Charles R.
2d Bn, 117th FA

LTC Harmon, Blake L.
CSM Snyder, Pugh K.
3d Bn, 117th FA

Division Artilleries

COL Fry, Alan K.
CSM Nett, David L.
28th IN Div (Mech) Arty

LTC Golden, Paul D.
CSM Winiacki, Ronald E.
1st Bn, 107th FA

LTC Walker, Martin H.
CSM Buch, Howard W., Jr.
1st Bn, 108th FA

LTC Scott, Mark W.
CSM Vonstein, Dale T.
1st Bn, 109th FA

COL Stevens, Wayne S.
CSM Sparkman, Miles E., III
29th IN Div (L) Arty

MAJ Schieman, Kenneth G.
CSM Rosier, William C.
2d Bn, 110th FA

LTC Tucker, Robert L.
CSM Glazener, Edwin H.
1st Bn, 246th FA

LTC Caporizo, James P., III
CSM Smith, Todd R.
2d Bn, 192d FA

COL Zieska, Kenneth W., Jr.
CSM Wog, Richard H.
34th IN Div (Mech) Arty

LTC Anderson, Mark E.
CSM Venaas, Bradley O.
1st Bn, 120th FA

LTC Kreye, John R.
CSM Beranek, Steven W.
1st Bn, 125th FA

LTC Bargfrede, Craig A.
CSM Peters, David B.
1st Bn, 194th FA

COL Tritsch, Thomas M.
CSM Wright, David L.
35th IN Div (Mech) Arty

LTC Kelly, Kenneth E.
CSM Kolessar, Paul
2d Bn, 122d FA

LTC Waggoner, Freddie R.
CSM Leach, John H.
2d Bn, 138th FA

LTC Thornbro, Michael A.
CSM Stevens, George E.
1st Bn, 161st FA

COL Montgomery, Michael B.
CSM Shelton, Joseph D.
38th IN Div Arty

LTC Osburn, Wesley N.
CSM Lincoln, Daniel G.
1st Bn, 119th FA

LTC Lootens, Philip
CSM Payne, Thomas B.
1st Bn, 134th FA

LTC White, James R.
CSM Severe, Thomas A.
3d Bn, 139th FA

COL Graham, Mark A.
CSM Andrews, Gary W.
40th IN Div (Mech) Arty

LTC Sawyer, Michael J.
CSM Duran, Jesse
1st Bn, 143d FA

LTC Smith, John F.
CSM Pointer, John W.
1st Bn, 144th FA

COL Pappas, Gary A.
CSM Blevins, Johnny L.
42d IN Div (Mech) Arty

LTC Dever, Chip A.
SGM Davison, Robert S.
1st Bn, 101st FA

MAJ(P) Batirodriquez, Jose
CSM Bailey, Curtis
1st Bn, 258th FA

LTC Orrigan, James T.
CSM Crossley, Robert F.
3d Bn, 112th FA

COL Villarreal, Pedro G.
CSM Dean, Herbert D.
49th AR Div Arty

LTC Hawkinson, David D.
CSM Riley, Robert I.
1st Bn, 133d FA

LTC Kohlhoff, Kris F.
CSM Fraga, Robert
3d Bn, 133d FA

MAJ(P) Hoggard, James S.
CSM Tafolla, Alexander G.
4th Bn, 133d FA

Separate Units

All battalions are corps as-
sets or, as annotated, DS to
16 separate brigades or the
11th ACR.

LTC Procopio, David J.
CSM Campbell, Steven F.
1st Bn, 86th FA

LTC Garren, Terrell N.
CSM Graves, Robert W.
1st Bn, 113th FA
(30th Sep Mech Bde)

LTC Davis, Walter F.
CSM Marlow, Johnny N.
2d Bn, 114th FA
(155th Sep AR Bde)

LTC Hetherington, Jeffrey W.
CSM Postle Gary A.
2d Bn, 116th FA
(53d Sep IN Bde)

LTC Laudano, Frank S.
CSM Kinghorn, David A. H.
3d Bn, 116th FA

LTC Chandler, Robert J., Jr.
CSM Pike, Eddie W.
1st Bn, 117th FA
(31st Sep AR Bde)

LTC Lee, Kenneth D.
CSM Ray, Claude E., III
1st Bn, 118th FA
(48th Sep Mech Bde)

MAJ(P) Swanson, Daniel M.
CSM Sanders, Ralph A., Jr.
2d Bn, 123d FA

LTC Miller, Joseph B.
CSM Dagley, Joe P.
3d Bn, 123d FA

MAJ(P) Hooper, Russell L.
CSM Butler, Harold, Sr.
1st Bn, 141st FA
(256th Sep Mech Bde)

LTC Kern, Daniel R.
CSM Culhane, Francis J.
2d Bn, 146th FA
(81st Sep Mech Bde)

LTC Kuemin, Richard A.
CSM Autenrieth, Robert E.
1st Bn, 148th FA
(116th Sep AR Bde)

LTC Weissinger, Jerrold D.
CSM Parsons, Jackie P.
2d Bn, 150th FA

LTC Hayes, Wayne M.
CSM Ninneman, Jonathan J.
1st Bn, 151st FA

LTC Boyles, Brent M.
CSM Genz, G. Neal
1st Bn, 152d FA

LTC Giacumo, Robert L.
CSM Wilson, Louis E.
1st Bn, 156th FA
(27th Sep IN Bde)

LTC Seitz, Charles R.
CSM Langley, Alvin D.
1st Bn, 160th FA
(45th Sep IN Bde)

LTC Santoni, Luis G.
CSM Latorre, Felix
1st Bn, 162d FA

LTC Oferrall, Rafael
CSM Soto, Juan A.
2d Bn, 162d FA
(92d Sep IN Bde)

LTC Alfonso, Ivan
CSM Arocho, Hector
3d Bn, 162d FA

LTC Cheeseman, Nicholas D.
CSM Carlile, Daniel E.
1st Bn, 163d FA
(76th Sep IN Bde)

LTC Fudger, Wesley J.
CSM Williams, James A.
1st Bn, 178th FA
(218th Sep Mech Bde)

LTC Salazar, Hugo E.
CSM Parris, Alan B.
1st Bn, 180th FA
(11th ACR)

LTC Sigmon, James R.
CSM Young, Yacob
1st Bn, 182d FA

LTC Diehl, Glen R.
CSM St. Clair, Patrick S.
1st Bn, 201st FA

LTC Patton, Dwight C.
CSM Looker, Edward L.
1st Bn, 202d FA

MAJ(P) Westenhaver, Randall C.
CSM Powell, Larry N.
1st Bn, 206th FA
(39th Sep IN Bde)

MAJ(P) Beckton, Timothy D.
CSM Hewell, Gerald M.
1st Bn, 214th FA

LTC Hussey, Benjamin T.
CSM Nodurft, Larry W.
2d Bn, 218th FA
(41st Sep IN Bde)

MAJ Logan, Arthur J.
CSM Inouye, Robert N.
1st Bn, 487th FA
(29th Sep IN Bde)

Marines

Col Gobar, Henry T.
SgtMaj Siverson, Paul W.
10th Marines

LtCol Brilakis, Mark L.
SgtMaj Cerda, Hector R.
1st Bn, 10th Mar

LtCol Singleton, Mark A.
SgtMaj Morris, Charles R.
2d Bn, 10th Mar

LtCol Hughes, William D., III
SgtMaj Brown, Michael A.
3d Bn, 10th Mar

Lt Col Cariker, Thomas L.
SgtMaj Gunn, Christopher C.
5th Bn, 10th Mar

Col Lesnowicz, Edward J., Jr.
SgtMaj Towry, Robert L.
11th Marines

LtCol Fondaw, Jeffrey E.
SgtMaj Bradley, Robert L.
1st Bn, 11th Mar

LtCol Kowalski, Bruce T.
SgtMaj Rollins, David S.
2d Bn, 11th Mar

LtCol Shupe, Daniel W., Jr.
SgtMaj Lee, Charles D.
3d Bn, 11th Mar

LtCol Campbell, Scott T.
SgtMaj Ward, Bryan P.
5th Bn, 11th Mar

Col O'Brien, Daniel C.
SgtMaj Dixon, Robin W.
12th Marines

LtCol Swain, Calvin F.
SgtMaj Mendiola, John M.
1st Bn, 12th Mar

LtCol Kelley, David A., Jr.
SgtMaj Williams, Alexander
3d Bn, 12th Mar

Col Rudder, Philip C.
SgtMaj Blagg, Thomas J.
14th Marines

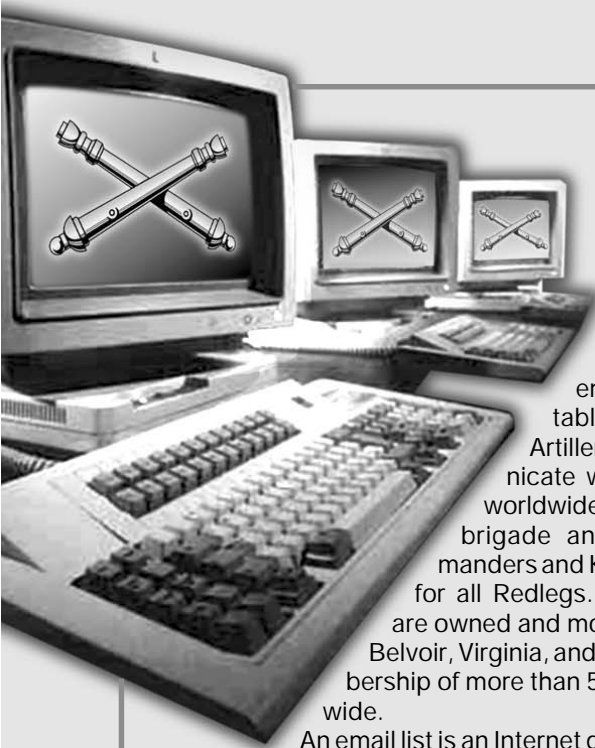
LtCol Bartch, Richard O.
SgtMaj Ryan, Oliver A.
1st Bn, 14th Mar

LtCol Deotte, James E.
SgtMaj Martin, Marvin E.
2d Bn, 14th Mar

LtCol Gunter, Frank R.
SgtMaj Cianchetta, Mario
3d Bn, 14th Mar

LtCol Hughes, Nathaniel F.
SgtMaj Howington, Jimmy G.
4th Bn, 14th Mar

LtCol Metreka, Gordon S.
SgtMaj Dewitt, John S.
5th Bn, 14th Mar



Redleg Email Lists

Virtual FA Conferences

Two years ago, two email lists were established for US Field Artillerymen to communicate with other Redlegs worldwide: Redleg6 for FA brigade and battalion commanders and King of Battle (KOB) for all Redlegs. Both mailing lists are owned and monitored out of Fort Belvoir, Virginia, and boast a total membership of more than 500 Redlegs worldwide.

An email list is an Internet discussion group to which people with common interests subscribe and share information. A member mails a message to that list's email address where the software, called a "listserver," broadcasts the message to all subscribers. This allows the sender to communicate with everyone on the list without having to create his own distribution list. Colonel Colen K. Willis, currently the Commander of the 212th FA Brigade, III Corps Artillery, Fort Sill, Oklahoma, initiated the two email lists while assigned to the Total Army Personnel Command (PERSCOM), in Alexandria, Virginia.

Redleg6. This mailing list's intent is to provide commanders around the world instant communications with each other to freely share information and exchange ideas. Current and incoming FA brigade and battalion commanders are automatically enrolled in Redleg6. Other Redlegs are not eligible for enrollment.

King of Battle. The KOB mailing list provides artillerymen worldwide a central location to present ideas, seek opinions, discuss current issues and ask for advice on artillery-related topics. It also provides a great opportunity for senior artillerymen to perform "cyber footlocker mentorship" to an attentive audience. Daily discussions and requests for information range from the use of the multiple-launch rocket system (MLRS) in the close fight to the role of the gunnery sergeant to how to use the single-channel ground and airborne radio system (SINCGARS) to who has good unit standing operating procedures (SOPs).

Personnel with email addresses inside the "mil" domain can subscribe to KOB and review the archives by going to <http://tso.belvoir.army.mil/kob/>. If your address is outside the "mil" domain, you can access subscription services at <http://desperimo.hoffman.army.mil/>. The address to the email lists will eventually change. If you can't find the servers, they are connected to the homepage of the Warfighting Integration and Development Directorate (WIDD) at the FA School, Fort Sill: <http://155.219.39.98/widd>.

Interacting with a List. Usually a list has multiple associated email addresses. First is an address to send administrative messages to, such as requests to subscribe,

commands to unsubscribe or requests for information (purpose of the list, help and list of membership). The second address is used to post messages for the entire subscription base. For Redleg6 and KOB, use Redleg6-request@tso.belvoir.army.mil or kob-request@tso.belvoir.army.mil for administrative requests, kob@tso.belvoir.army.mil or redleg6@tso.belvoir.army.mil to post messages, and owner-kob@tso.belvoir.army.mil or owner-redleg6@tso.belvoir.army.mil to talk to the owner. Redleg6 and KOB offer subscribers access to web archives of previous discussions.

Both Redleg6 and KOB are moderated lists. The list owners filter out messages that are not appropriate for or were inadvertently sent to the mailing list. The drawback to a moderated list is it requires human intervention that delays the posting of a message. It also may give the impression that discussions are being censored.

Subscribers should avoid some common errors. Don't hit the "reply to" button on your email program; send, "Hi, Joe! How are you. Do you remember that bonehead boss we had at..."; and think that only "Joe" will get that message...the entire subscription base will. Don't send junk mail or large attachments through the server. You can announce you've posted the document, such as an SOP, in another location or ask the list owner to put it on the KOB or Redleg6 web site.

Don't change the subject line of the message under discussion, and don't clog the server by sending the entire message discussion with every additional comment—send snips of the discussion to which you are referring. If your comment lacks "meat" for the conversation—such as "Me, too" or "I agree"—don't clog the server with it. Send it "off line" to the intended recipient. A rule of thumb is that your message should have value to someone other than yourself and the intended recipient.

One last caution. Just as with any email list or chat room online, the quality of the ideas and procedures espoused are only as good as the knowledge and intent of the individual putting out the information. The owners monitor the lists for profanity and obvious inappropriateness, but they do not have subject matter experts screen the information. Make no assumptions about the safety, unclassification, accuracy or completeness of the information in any discussion or that suggested procedures or options are, necessarily, the best available.

These email lists allow you to tap into the collective experience of other Field Artillerymen to solve FA or fire support problems or learn new procedures and efficiencies—start chatting via Redleg6 or King of Battle.

MAJ Kenneth H. Fritsch, FA
Former Strategic Automation Planner
PERSCOM, Alexandria, VA

SILHOUETTES OF STEEL

I Corps Artillery

I Corps Artillery, headquartered in Salt Lake City, Utah, continues to provide total force fire support to I Corps- *America's Corps*. Readiness and a continuing focus on realistic training were our constant goals for the year. I Corps Artillery remains battle-focused and trains to deploy and fight in any contingency, anywhere, joint and combined.

Training the Corps Artillery. I Corps Artillery's training year was centered on proficiency training on the advanced Field Artillery tactical data system (AFATDS), successfully fielding the newest equipment and software upgrades, further enhancing our ability to command and control fires on the battlefield. I Corps Artillery is ready to employ the new improved AFATDS during the I Corps' Warfighter in the next training year.

In January, I Corps Artillery deployed to Japan for another successful Yama Sakura exercise supported by the 115th FA Brigade (WYARNG) and the 153d FA Brigade (AZARNG). The Corps Artillery was given the deep fight mission in support of the Japanese maneuver forces. With no US maneuver forces in the battle, the Corps Artillery used artillery task forces that could operate independently and be self-sustaining within the Japanese Army zone. This was a unique way of operating, but I Corps Artillery significantly influenced the battle by firing Army tactical missile system (ATACMS) missiles at high-pay-off targets (HPTs) deep in the corps and division zones and by planning, coordinating and executing all SEAD and joint SEAD missions in support of the Japanese Army's deep attacks. By employing advanced techniques for fighting the deep battle, we were instrumental in the opposing force's (OPFOR's) overwhelming defeat.

I Corps Artillery hosted a February deployment by the 135th FA Brigade (MOARNG) and its two M198 155-mm battalions at Dugway Proving Ground, Utah, for a month of AT exercises. The battalions' AT was a very successful winter training in the high desert environ-



At Camp Williams, Utah, Redlegs of 2-222 FA stationed in Cedar City move their Paladins to a firing position.

ment for the Midwestern cannon-cockers.

With summer came the Global Patriot exercise deployments at Dugway Proving Ground and Fort Lewis, Washington. A/2-123 FA Battalion (ILARNG) deployed to Dugway Proving Ground to train with our Utah special forces and our fire support teams (FISTs) in a successful operation, including conducting live-fire joint air attack team (JAAT) operations and firing Copperhead. The fire support element (FSE) and the deep operations coordination cell (DOCC) conducted training in the exercise at Fort Lewis while the Corps Artillery Headquarters linked in from Salt Lake City. The distributed exercise was portrayed in the joint conflict model (JCM) being operated at Fort Lewis.

September brought a deployment to Fort Lewis for I Corps' Cascade Mist exercise and a great chance to work with a full plate of FA brigades on sharpening warfighting skills in preparation for the 25th Infantry Division (Light) and I Corps Battle Command Training Program (BCTP) Warfighter exercises.

I Corps Fire Support Conference. January 1999 brought the I Corps fire support community together for the 17th Annual Fire Support Conference at Salt Lake City. Brigadier General Stanley J. Gordon, I Corps Artillery Commander, hosted the conference and presented command guidance and direction for the corps and its fire support units. This

guidance set the standards for productive mission-oriented training for the upcoming year.

Conference presentations covered a variety of fire support subjects and were given by MG Roger C. Schultz, Director of the Army National Guard; the I Corps Simulation Center; the US Field Artillery School; III Corps Artillery; Army Automation; and the I Corps G3, G2 and Chief of Staff.

Representatives from a large portion of the FA brigades, division artilleries, corps support command (COSCOM) and many FA battalions attended. The conference continues to

provide an excellent opportunity for command interface within I Corps and the fire support community.

Utah ARNG. As well as its warfighting mission with I Corps, I Corps Artillery assumes an important and active role in the UTARNG. I Corps Artillery provides administrative, logistical, operational and training support for two in-state battalions, the 1-145 FA (155-mm, towed) in Salt Lake City and 2-222 FA (155-mm self-propelled) in Cedar City, and one firing battery and FIST slice (B/1-148 FA and Det 3/HHB/1-148 FA) located in Logan and Salt Lake City, part of the 1-148 FA Battalion headquartered in Idaho.

Supporting the Total Force. I Corps Artillery continues to be a leader in providing training assistance, guidance and coordination for a major portion of the Reserve Component (RC) FA brigades. These units and their FA battalions are located throughout the US. Participation with these brigades during exercises and training conferences continues to be one of the highlights of I Corps Artillery's responsibilities.

I Corps Artillery, one of the US Army's four corps artilleries, is proud to be associated with our high-quality RC Redlegs who are so committed to the defense of our country. I Corps Artillery is meeting the challenge and fusing the Total Force into one as the Army's only RC Corps Artillery. We are ***America's Corps Artillery!***

SILHOUETTES OF STEEL

III Corps Artillery

The IIIrd Armored Corps Artillery *Phantom Thunder*, Fort Sill, Oklahoma, is the Army's largest and most powerful concentration of artillery. It contains four FA brigades with nine MLRS battalions, three Paladin battalions and a maintenance battalion.

17th FA Brigade. 1999 began with the *Thunderbolt Brigade* honing its battle skills during the III Corps Warfighter followed by four off-post deployments and culminating with the US/ROK combined counterfire exercise in Korea.

5-3 FA (MLRS) *1st Round Battalion* deployed to the NTC in support of the 4th BCT, 4th Infantry Division (Mechanized), Fort Hood, Texas. It became the first battalion from Corps Arty to deploy a battery (TF Comanche Thunder) to Kuwait in support of Operation Southern Watch.

1-12 FA (MLRS) *Raider Battalion* deployed to Twentynine Palms, California, for Desert Fire Exercise (DESFIREX) and conducted a joint CALFEX with the 1st Marine Division.

After an excellent performance for the History Channel's "Tales of the Gun" special, 3-18 FA (155 SP) *Steel Professionals* conducted an EXEVAL at Fort Sill and an O&I rotation to the NTC. The battalion also deployed to Fort Riley, Kansas, to participate in a CALFEX with the 3d BCT, 1st Armor Division.

75th FA Brigade. The 75th *Diamond Brigade* has had a busy and lethal year, including deploying the entire brigade to Fort Chaffee, Arkansas, for a 30-day FTX that included two battalion EXEVALs. The 1-17 FA *Copperheads* started the year with battery and battalion FTXs and ended with battery EXEVALs. In September, a battery from 1-17 FA deployed to Australia for 30 days while the rest of the battalion deployed to Fort Chaffee.

April saw the 6-27 FA (MLRS) *Proud Rockets* deploy with organic equipment, personnel and a DS maintenance team to Fort Chaffee for a six-day battery FTX, culminating with Artillery Table VIII qualifications. The battalion also deployed downrange for platoon ARTEPS and sent key leaders to Korea for a combined counterfire exercise with the 2d Infantry Division Artillery and the ROK corps artilleries. In addition, the battalion conducted a 10-day Go-To-War FTX.

1-77 FA (MLRS) *Falcon Battalion* sent soldiers to Korea in support of Ulchi Focus Lens and Fort Hood for the III Corps Warfighter. The battalion supported 1-12 FA's EXEVAL and went through its own in the fall. 1-77 FA also live-fired the M270A1 launcher in tests at White Sands Missile Range, New Mexico.

212th FA Brigade. The *Courage and Command Brigade* stayed on the move in 1999.

2-5 FA (Paladin), DS to the 3d ACR, demonstrated its versatility by deploying with the 1st BCT, 1st Infantry Division (Mechanized) to the NTC in April in a reinforcing role. The battalion then executed Operation Viking Thrust, an extended FTX, firing 2,994 rounds, including an impressive 54 Copperheads. In November, 2-5 FA underwent a demanding seven-day EXEVAL.

2-18 FA (MLRS) *Mission Ready*, the only CONUS battalion that can fire ATACMS Block IA munitions, prepared for worldwide deployments. In April, A Battery deployed a platoon package to Albania in support of TF Hawk. In June, the brigade administered a mentally, physically and tactically challenging EXEVAL. In the fall, 2-18 FA deployed its O&I sections and its combat trains to the NTC in support of the 3d BCT of the 1st Cavalry Division, Fort Hood.

After returning from an exciting deployment to Fort Chaffee, 6-32 FA (MLRS) *Proud Americans* prepared for "best by test" evaluations of each battery's ability to move, shoot, communicate and sustain itself. The battalion then concentrated on supporting the 2d BCT of the 3d Infantry Division with its O&I section and combat trains deploying in the early winter to the NTC.

214th FA Brigade. The *Naturally We Lead Brigade* maintained a fast-paced training and deployment program throughout 1999. Although the 47th Combat Support Battalion inactivated this year, the brigade remains the largest, most diversified FA brigade in the Army with three battalions of MLRS, a maintenance battalion, a trans-

portation company and an ordnance detachment.

The brigade traveled to Germany in March to conduct a BCTP Warfighter and ramp-up with V Corps. This was its fourth Warfighter in 18 months. It also participated in III Corps exercise Road Runner at Fort Hood and demonstrated seamless brigade jump-TOC operations. The 214th conducted command inspections of all battalions and EXEVALs of the MLRS battalions. The EXEVALs included rail load, air load and 380-mile convoys, as well as many ATACMS SEAD missions, live-fire platoon raids, air MEDEVAC, forward resupply by air, night decontamination and other warfighting tasks.

The three MLRS battalions conducted major off-post deployments while simultaneously reconfiguring launchers and other equipment to the 3x6 MTOE. 1-14 FA deployed to Fort Chaffee in March and to the NTC. 3-13 FA deployed to Twentynine Palms in support of the Marine DESFIREX II. The battalion also deployed a platoon to Alaska for exercise Northern Edge and supported the V Corps Warfighter exercise (WFX) in Germany. 2-4 FA deployed to Fort Carson, Colorado, to support the 14th Marine Regiment.

19th Maintenance Battalion soldiers deployed everywhere from Albania to Kuwait while maintaining its standard of superb support for III Corps Arty units.

III Corps Artillery's aggressive training programs and deployments have kept the *Phantom Corps Artillery* battle-focused and ready to support the III Armored Corps in contingency operations, anywhere, anytime- **Phantom Thunder!**



A launcher from Alpha Battery, 2-4 FA conducts a semi-annual live-fire qualification.

SILHOUETTES OF STEEL

V Corps Artillery

V Corps Artillery in Germany remains *Steadfast and Strong* as the only forward-deployed Corps Artillery in the US Army. This year, V Corps Artillery excelled in deep operations and provided fire support for many joint training and contingency exercises. The Corps Artillery completed high-intensity, battle-focused training that included a Battle Command Training Program (BCTP) Warfighter exercise and operational deployments to Albania and Kosovo in support of Operation Allied Force.

Joint/Combined Exercises. The year began with V Corps Artillery's participation in Arcade Fusion, an exercise with NATO's Allied Rapid Reaction Corps. Working with the United Kingdom's Royal 1st Field Artillery, V Corps Artillery compared doctrine, exchanged ideas and promoted international relations with its allied partners. The exercise was a successful opportunity for information exchange and validated our approach to deep fires in a multinational/joint environment.

The next training opportunity for V Corps Artillery was Agile Lion, a joint exercise with the Southern European Task Force (SETAF). During this exercise, the Corps Artillery helped plan disaster relief and humanitarian assistance operations. This stability and support operation (SASO) training allowed V Corps Artillery soldiers to strengthen their relationships with soldiers in elements they will work with during war.

Following Agile Lion, V Corps Artillery marched into exercise Victory Focus, a V Corps command post exercise (CPX) for commanders and staffs from the corps to separate brigades to rehearse combat operations prior to the BCTP Warfighter. This rehearsal ensured V Corps Artillery's success as it moved flawlessly into Desert Victory and Urgent Victor-its Warfighter exercises with the 1st Armored Division, also in Germany. During these exercises, the V Corps Artillery tactical operations center (TOC) coordinated and executed the Corps deep fight with fires from seven FA brigades—three active and four ARNG brigades.

Multiple-Launch Rocket System (MLRS) Training. In the midst of Corps exercises and deployments, the 41st Field Artillery Brigade continued to ensure training remained its focus. The



V Corps' 1-27 FA sends another rocket roaring down range at Grafenwoehr.

brigade conducted a 10-day EXEVAL rotation at Grafenwoehr Training Area—Railgunner XII for 1-27 FA (MLRS) assisted by an observer/controller team from 6-32 FA (MLRS), part of the 212th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma. This rigorous exercise evaluated the battalion and its batteries on all high-intensity conflict tasks. A modified battery EXEVAL and live-fire certification—Railgunner XIII—was conducted in March as the battalion's final validation before deploying to Albania.

Operation Allied Force Support. V Corps Artillery deployed to Albania as part of Task Force Hawk, performing a vital role in Operation Allied Force. Critical to Task Force Hawk's success was the deep operations coordination cell (DOCC). During the operation, the DOCC simultaneously planned for deep operations and provided targeting assistance for US Air Force operations.

The DOCC effectively used the automated deep operations coordination system (ADOCS). This system can rapidly transmit consolidated information for battlefield coordination and synchronization. ADOCS also facilitated the coordination of targets acquired by the Q-37 Firefinder radar among the DOCC, the Combined Air Operations Center (CAOC) and the Battlefield Coordination Element (BCE). This ensured the rapid application of air power. The targeting process allowed the Air Force to expand its attacks from fixed targets to mobile targets throughout Yugoslavia.

The 41st FA Brigade, the Force Field Artillery Headquarters (FFA HQ), pro-

vided Task Force Hawk a headquarters to coordinate and synchronize all required fire support. Task Force Hawk stood ready as the MLRS from 1-27 FA (-), augmented by four M270A1 launchers from 2-18 FA, 212th FA Brigade, conducted more than 16 mission rehearsal exercises in conjunction with the 11th and 12th Aviation Regiments. At the same time, C/25 FA (TAB), 1st Armored Division Artillery, scanned the terrain for enemy targets with its Q-36 and Q-37 radars. When the initial entry force moved into the province of Kosovo, HHS, 1-27 FA became the FFA HQ for Task Force Falcon. This force of A/4-27 FA, 1st AD (M109A6), F/2/10 Marines, 26th Marine Expeditionary Unit (MEU) (SOC) (M198) and C/1-319 FA, 82d Airborne Division (M119) stood ready to fire as the first elements of Task Force Falcon moved into Kosovo.

Additionally, 1-27 FA (-) conducted non-standard missions in Kosovo, such as augmenting the 1st Infantry Division (Mechanized) in mounted and dismounted patrols through treacherous terrain and providing assistance to the seemingly endless influx of Albanian refugees. Clothing and furniture were returned to their rightful owners in what proved to be an extremely difficult but rewarding process.

V Corps Artillery continues to provide professional, flexible and agile fire support across the spectrum of conflict. As V Corps Artillery moves forward, some of the finest soldiers in the US Army remain in Europe-ready to defend freedom here and throughout the world—***Steadfast and Strong!***

SILHOUETTES OF STEEL

XVIII Airborne Corps Artillery

The XVIII Airborne Corps Artillery *Dragonfire* at Fort Bragg, North Carolina, continues to maintain a crisis response artillery force manned, equipped and trained to deploy by air, sea, land and parachute assault anywhere in the world within 18 hours of notification. The Corps Artillery Headquarters, 18th Field Artillery Brigade (Airborne)-three M198 howitzer battalions, one MLRS battalion and two Field Artillery target acquisition detachments-provide cannon, rocket and missile fires while planning, coordinating and synchronizing joint fire support to the Army's strategic contingency force.

XVIII Airborne Corps Artillery. Corps Artillery units superbly executed all training exercises and real-world missions throughout the past year. The XVIII Airborne Corps Artillery provided a deep fires task force for Operation Southern Watch composed of one battery of MLRS/ATACMS, a meteorological section and a Q-37 radar section. Additionally, a battery-sized element trained to provide security for Operation Southern Watch in the Southwest Asia area of operations. The Corps Artillery provided timely, lethal fires and fire support planning during the XVIII Airborne Corps' and the 3d Infantry Division's respective Warfighter and Joint Expeditionary Force Experiment Exercise.

Dragonfire soldiers continue to lead the Field Artillery on the cutting edge of fire support technology. A/511 Parachute Infantry Regiment (PIR) continued testing the enhanced fiber-optic guided missile (EFOGM) during March 1999 at a live-fire exercise (LFX) at Fort Benning, Georgia. March also brought A/511 PIR an additional mission to test

the line-of-sight anti-tank missile (LO-SAT).

3-27 FA (MLRS) is rigorously testing a platoon of high-mobility artillery rocket system (HIMARS) prototypes. The platoon consists of MLRS mounted on the long wheel-based chassis of the family of medium tactical vehicles (FMTVs). The HIMARS platoon was successfully integrated into battalion maneuvers during two challenging LFXs in March and April 1999 and the battalion's EX-EVAL in April 1999. May 1999 saw HIMARS undergo many contractor upgrades based on test results. Also, C/1-377, stationed at Fort Campbell, Kentucky, led cannon artillery to the future of towed artillery digitization by testing the automated howitzer (AH-155), a part of the Rapid Force Projection Initiative (RFPI), which includes the 101st Airborne Division (Air Assault) out of Fort Campbell.

On 26 May 1999, XVIII Airborne Corps Artillery hosted the Light Fire Support Conclave in an effort to present a unified voice in determining the minimum acceptable requirements for the development of a light future direct support weapon system (FDSWS). The Reserve Component Field Artillery Conference in August presented a forum for all National Guard FA Brigades wartraced to the XVIII Airborne Corps Artillery to discuss training and wartime integration.

The XVIII Airborne Corps Artillery continues to proficiently plan, manage and project the Corps' devastating firepower deep onto the battlefield and win the fight for America's contingency corps.

18th Field Artillery Brigade (Airborne). The 18th Field Artillery Brigade (Airborne) once again lived up to its motto- *Tough, Proud and Disciplined.*

The brigade completed three rotations at the NTC, four rotations at the JTRC and two MLRS rotations in support of Operations Southern Watch and Intrinsic Action in Kuwait. The brigade accomplished these tasks while simultaneously fielding new equipment and remaining focused on contingency mission readiness.

The brigade conducted EXEVALs of 1-321 FAR (Abn) in August 1998 and 1-377 FAR (AAslt) in March 1999. These two battalions successfully conducted an emergency deployment readiness exercise (EDRE) and uploaded their vehicles onto Air Force aircraft. 1-321 FAR (Abn) air-dropped 24 heavy-drop platforms and 550 jumpers. Both battalions confronted civilians and reporters on the battlefield, dealt with persistent attacks by the OPFOR and fired accurate, timely battery and battalion mass missions, thus exemplifying the versatility required in today's contingency operations.

The 18th FA Brigade (Airborne) remains focused on the future and continues to transition to Force XXI. The brigade will field the advanced SINC-GARS improvement program (ASIP) version of SINC-GARS by January 2000 and AFATDS by May 2000.

The 18th FA Brigade (Airborne) operations tempo will not slow down in the new millennium. The brigade will host two air assault mobile training teams (MTT), a rappelmaster MTT and support the 82d Division (Airborne) Warfighter exercise in January 2000. The brigade also will participate in two joint training events: the Combat Aerial Delivery System Instructor's Course Capstone Exercise in September 1999 with the Air Force, and a 10th Marine training exercise at Camp Lejeune, North Carolina, in February 2000. Additionally, three EDREs are planned during the next FY for 3-321 FAR in November 1999, 1-321 FAR (Abn) in February 2000 and 3-27 FAR (MLRS) in March 2000. Finally, the brigade will deploy reinforcing artillery packages to the combat training centers (CTCs), including the prototype HIMARS.

The XVIII Airborne Corps Artillery and 18th Field Artillery Brigade (Airborne) continue to prepare to respond to worldwide crises, both present and future. ***Thunderbolt, Air Assault, Steel Rain, Airborne-Dragonfire!***



XVIII Airborne Corps Artillery prototype HIMARS, part of a HIMARS platoon in 3-27 FA.

SILHOUETTES OF STEEL

Field Artillery Training Command

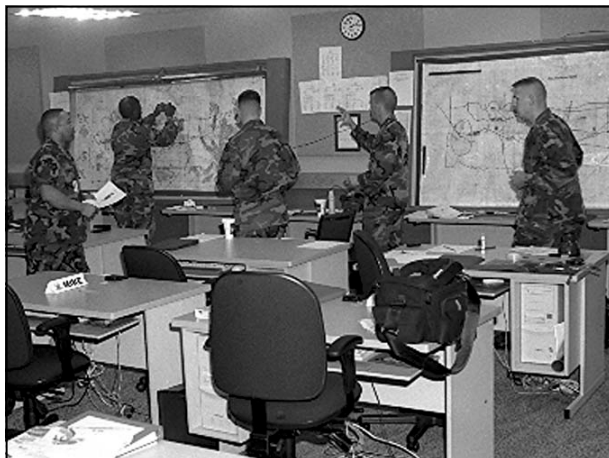
The FA Training Command at Fort Sill, Oklahoma—home of the US Army and Marine Field Artillery—continues to prepare soldiers, Marines and leaders to enter the next millennium. We are working to prepare the best trained fire supporters to provide timely, accurate fires anywhere in the maneuver commander's battlespace. Our vision, "Cutting Edge Fires for the 21st Century," is shaping the near- to mid- term modernization of our force and posturing the FA to better support the maneuver commander in the future. It looks to 2025 and beyond while firmly nesting our efforts to evolve concepts of the Army After Next with the Army Experimentation Campaign Plan (AECPP) and builds on our legacy of providing responsive fires to the combined arms team.

Training and Developments. In June, the FA Training Center (FATC) became the Army's third initial entry training (IET) site to execute gender integrated basic combat training. The FATC will train approximately 10,000 men and 5,000 women soldiers annually. To support the new mission, 37 women drill sergeants have been assigned to FATC. Men and women are billeted separately but are integrated to the squad level for training. The rigorous nine-week basic training POI remains unchanged.

The FA Officer Basic Course (FAOBC) curriculum implemented two years ago continues to meet with great success. The increased use of senior NCO instructors has been a key contributor. OBC teaching materials are on the Gunnery Department home page: <http://sill-www.army.mil/gunnery>. Topics ranging from lesson plans to general gunnery information are available.

Our FA Captains Career Course (formerly FAOAC) has been reduced from 20 weeks to 18 weeks and continues to leverage the video teletraining network to provide FA captains innovative training opportunities. Seven classes a year are taught and synchronized with the seven Combined Arms and Services Staff School (CAS³) classes taught at Fort Leavenworth, Kansas.

The NCO Academy trained more than 1,800 students this year. Our Academy



NCOs at Fort Sill take the Battle Staff Course taught by Fort Bliss via distance learning to Sill and Forts Bragg, Benning and Hood. (Photo by Kevin Tucker, Fort Sill TSC)

now offers the First Sergeant and Battle Staff NCO Courses via distance learning. Although these courses are not actually part of the NCO Educational System (NCOES), they provide formal institutional training to fill two important positions: first sergeant and the battle staff NCO. Currently, Academy classrooms are being upgraded to train more students and provide better training enhanced by technology.

In FY99, the FA School's Warfighting Integration and Development Directorate (WIDD) began revising 11 of our 25 field manuals. Two of these FMs— *FM 6-20-60 Tactics, Techniques and Procedures (TTP) for Fire Support for Corps Operations* (scheduled to be out Third Quarter, FY00) and *FM 6-70 TTP for M109A6 (Paladin) Operations* (scheduled to be out First Quarter, FY00)—are new manuals. In support of the Experimental Force, the 4th Infantry Division (Mechanized) at Fort Hood, Texas, WIDD produced *XST 6-60 TTP for Division MLRS Operations* (Jan 99) and *XST 6-20-30 TTP for Fire Support for Digitized Division Operations* (Mar 99).

FY99 also saw the emergence of the WIDD home page on the internet as a source of doctrinal information: <http://155.219.39.98/widd>. Readers can download publications, submit comments and access the status of our FMs.

Cutting Edge Systems. Crusader and AFATDS continue to lead the Army as the premier weapon and digital systems for Army XXI. In July, Crusader rolled out its first prototype vehicle: the resupply

vehicle (RSV). The first self-propelled howitzer prototype will be delivered in First Quarter, FY00.

AFATDS fielding continues on schedule to units in the XVIII Airborne Corps Artillery, Fort Bragg, North Carolina, to be completed by year's end. Fielding also began in the Marine Corps and will continue into next year.

Wheeled prototypes of MLRS, the high-mobility artillery rocket system (HIMARS), continued extended user evaluation at 3-27 FA, part of the 18th Field Artillery Brigade at Fort Bragg. M270A1 launcher development testing was conducted both at White Sands Missile Range in New Mexico and Fort Sill with soldiers from III Corp Artillery.

Preparations are ongoing for conducting operational testing in early FY01 and fielding to the first digitized division.

MLRS munitions continued to expand with the fielding of the extended-range MLRS (ER-MLRS) to US Forces in Korea. The guided MLRS (GMLRS) is currently being co-developed by the United States, United Kingdom, Germany, France and Italy.

The ATACMS Block IA missile continues production and fielding to stockpiles worldwide. ATACMS Block II with basic BAT continued developmental testing leading to operational testing in FY00. Fielding will begin in the Fourth Quarter of FY01.

The XM982 extended-range guided projectile (Excalibur) is currently in contractor development testing and, to date, the program is very successful. Excalibur will provide the Field Artillery a more lethal family of 155-mm projectiles.

SADARM product improvement was initiated. The projectile will have an improved SADARM submunition with an improved sensor and warhead. Fielding of SADARM is projected for late FY03.

Work began this year on the towed artillery automation program: LW 155 digitization. The Marine Corps will receive the LW 155 in FY03 and the Army in FY05.

On the eve of the next millennium, we continue to provide timely, accurate fires for our maneuver commanders while taking the FA to another plateau of excellence—enable and deliver full-spectrum effects— ***Fires the Cutting Edge for the 21st Century!***

SILHOUETTES OF STEEL

1st Armored Division Artillery

1999 saw the 1st Armored Div Arty, Germany, deployed in multiple operations throughout the Balkans and participating in challenging training.

In January, the Div Arty Headquarters, 4-27 FA and O/Cs from 2-3 FA executed a demanding five-day EXEVAL across 4,000 square kilometers of Germany before returning to Baumholder for a thorough live-fire evaluation. By March, we were set to participate in the V Corps Warfighter at Grafenwoehr. With our new deep operations coordination cell (DOCC) that planned and coordinated deep fires with our automated deep operations coordination system (ADOCS), the division was highly successful. As the Force FA Headquarters, the Div Arty controlled the division's organic FA and, at times, five additional FA brigades, setting BCTP records for massive preparations.

Operation Allied Force called for the Div Arty to deploy again to the Balkans. FSEs from 4-27 FA and 2-3 FA, the radar of C/25 FA and the guns of A/4-27 FA were integral to the success of Task Force Hawk. Then A/4-27 FA led the



2-3 FA conducts rafting operations during Operation Rolling Steel 99.

way into Kosovo, augmenting Task Force Falcon and the KFOR until relieved by the Redlegs of the 1st Infantry Division (Mechanized). The FA radars in Operation Allied Force provided data directly to Div Arty personnel working in the Combined Air Operations Center, who quickly massed air power on Serbian positions. In addition, other Div Arty assets were on alert for Task Force Thunder to provide MLRS for lethal SEAD in other areas of the Balkans.

The Div Arty then settled down to restore high-intensity combat skills, primarily through maneuver coordination exercises, Grafenwoehr gunnery and

CMTC rotations. Rolling Steel 99 expanded the maneuver box to 7,000 square kilometers and added the largest river crossing since the Sava River in 1996.

Next, with only 48 hours of notice, C/25 TAB (-) deployed to provide force protection to the August 99 Balkan summit. The unit drew equipment from the 1st Team Division Artillery in Tuzla, road marched to Sarajevo and executed Operation Bolero.

The 1st Armored Div Arty continues to answer America's call, providing devastating fire support to *America's Tank Division. Iron Steel!*

1st Cavalry Division Artillery

The 1st Cavalry Division Artillery *Red Team*, Fort Hood, Texas, experienced yet another fast-paced and exciting year with many of our Redlegs deployed to the Balkans.

Two of our DS battalions with elements from 1-21 FA and the Division FSE deployed to Bosnia as part of Task Force Eagle in support of the Stabilization Force (SFOR). In all, the *Red Team* deployed more than 1,000 soldiers. The Div Arty FSE assumed the critical task of running the Multinational Division (North) Information Operations Cell.

The *Dragons* of 1-82 FA were welcomed home in March from their six-month deployment during SFOR4. The *Dragons* quickly reintegrated training into fast-paced warfighting. The training climaxed with the 1st BCT EXEVAL in preparation for a rotation to the NTC in January 2000.

The *Steel Dragons* of 2-82 FA had the critical mission of preparing deploying soldiers for the Bosnia mission and subsequent reintegration training. 2-82 FA continued to hone its warfighting skills through many FTXs, culminating with

an intense 3d BCT EXEVAL. The *Steel Dragons* deployed to the NTC in September, the division's first NTC rotation since receiving the SFOR mission in spring 1998.

3-82 FA, *Red Dragons*, executed the mission in Bosnia from March to September as part of SFOR5. Upon returning, it immediately began rigorous reintegration training to prepare for the 2d BCT's NTC rotation this spring.

1-21 FA, *First Strike*, completed its 3x6 reorganization, including adding a Texas ARNG MLRS battery as its third firing battery. The battalion continued training to provide devastating deep MLRS fires via LFXs. Additionally, C/1-21 FA (TA) deployed to Bosnia and provided 24-hour force protection for Task Force Eagle.

Also this year, the *Red Team* fielded the most advanced fire support hardware and software available: AFATDS A98 and the hand-held terminal unit (HTU).

The *Red Team* is looking forward to 21st century challenges to continue the traditions of excellence of our proud Cavalry heritage. *Red Team!*



2-82 FA Paladins fire lethal rounds down range.

SILHOUETTES OF STEEL

1st Infantry Division (Mechanized) Artillery

The oldest Div Arty in the Army, the *Drumfire Artillery* in Germany, spent the year providing devastating, lethal fires for the 1st Infantry Division and adding to the glorious legacy of the *Big Red One*.

The year began with the 1-6 FA *Centaur*s and the 1-7 FA *First Lightning* conducting Paladin lanes at Grafenwoehr. Both performed superbly while conducting scenario-driven movement-to-

contact, degraded operations and Cop-perhead lanes, culminating with Table XVIII EXEVALs. Additionally, 1-6 FA fired in support of the 3d BCT's CMTC live-fire exercise.

Our sister battalion, 1-5 FA *Hamilton's Own* at Fort Riley, Kansas, conducted a hard-charging "gauntlet" train-up for the NTC in support of the 1st BCT. Additionally, 1-5 FA deployed fire support to Bosnia-Herzegovina.

Before donning the new colors of 1-33 FA, A/33 MLRS *Arapaho* and B/25 TAB *Wolfpack* conducted a highly successful maneuver rights exercise across the German countryside, culminating with a battery mass fire exercise in Grafenwoehr.

The Div Arty honed its high-intensity Warfighting skills at the CMTC against the world-class OPFOR.

Additionally, the Div Arty revisited its prowess at conducting stability and

support operations (SASO) during mission-rehearsal exercises.

1-7 FA, D/1-33 (TAB) and a meteorological section from HHB, Div Arty were among the first units to hit the ground in Kosovo with the essential task of providing fire support to Kosovo forces. Living up to its moniker, *First Lightning* fired the first US 155-mm rounds in support of operations in the Balkans. Ten illumination rounds in four fire missions supporting ground operations proved the *Big Red One's* 24-hour supremacy and unchallenged authority. 1-6 FA assumes responsibilities as the Force FA Headquarters in Kosovo in December.

The Div Arty expanded its capacity for deep fires exponentially by activating 1-33 FA (MLRS/TA) on 2 June 1999. The *Golden Lions* continue to build combat power, integrating the former A/33 FA and B/25 FA into an 18-launcher battalion.

On the threshold of the 21st century, we stand strong on two continents ready to catapult the *Big Red One* into the next millennium. **Drumfire!**



1-7 FA fired the first rounds ever in the Balkans—the first time an operational fire mission was fired from a Paladin.

2d Infantry Division Artillery

The 2d Infantry Div Arty *Warrior Thunder* in Korea is the most forward deployed Division Artillery in the world and, with our coalition partners of 49 years, stands ready to deter war, preserve peace and hold the line in defense of the Korean peninsula.

As the Ground Component Commander's (GCC's) Counterfire Headquarters, the 2d Div Arty synchronizes the combined and coalition battlefield, commanding and controlling a counterfire task force consisting of more than 15 US and ROK artillery battalions, an engineer battalion (+), infantry battalion (+), a forward support battalion and other slice elements.

During the past year, 6-37 FA (+) (MLRS) *First to Fire*, the most lethal ground force on the Korean Peninsula, helped the ROK Army with its first MLRS battalion. This year, C/6-37 fielded the improved position determining system



6-37 FA MLRS live fires in the mountainous terrain of Korea.

(IPDS) that allows their launchers to fire Block IA ATACMS missiles. The missiles are highly lethal and accurate at a range of 300 kilometers.

The Paladins of 1-15 FA *Guns* conducted many live-fire training events in support of the 1st *Iron* BCT. The battalion also completed a demanding EXEVAL conducted by the 2d Div Arty and 2-17 FA. 1-15 FA conducted partnership exchange events with the 70

(ROK) FA, DS to the 20th Mechanized Brigade, and the 659 (ROK) FA of the VI ROK Corps. The *Guns* also supported the key theater training events of Summerex and Ulchi Focus Lens.

2-17 FA *Steel* honed its warfighting skills and Paladin proficiency through many CALFEXs and CPXs, executing its DS mission to the 2d *Strike Force* BCT. Most notable were three iterations of the brigade's Triple Threat exercise, a

CALFEX for the mechanized and air assault battalions of the Army's only combined brigade.

The Firefinder radar Redlegs of F/26 FA (TAB) *Wolfpack* participated in every Div Arty live-fire and simulation exercise this year, keeping their skills honed to a razor's edge.

Our Redlegs are trained and ready to deter—but will fight and win decisively, if called upon. **Warrior Thunder!**

SILHOUETTES OF STEEL

3d Infantry Division (Mechanized) Artillery

The 3d Infantry Div Arty, Fort Stewart, Georgia, started the year focused on the Division Warfighter in February 1999. *Marne Thunder*, fighting alongside the 151st FA Brigade *Gamecock Artillery*, SCARNG, and 212th FA *Courage and Command* Brigade from Fort Sill, Oklahoma, provided devastating fires in an overwhelming victory over the world-class OPFOR. Applying lessons learned, we continued to focus on our mission to deploy, fight and win as part of the Army's premier rapid deployment heavy division.

The Div Arty supported our National Military Strategy in many exercises and deployments throughout the year: Ulchi Focus Lens (UFL), Bright Star, Lucky Sentinel and Intrinsic Action. These exercises provided challenging, multi-echelon training opportunities and ensured our readiness to deploy worldwide while demonstrating our commitment to our allies.

1-9 FA started the year with A and C Batteries deployed to Kuwait in support of Operation Desert Fox. A Battery re-

mained with Task Force 3-15 Infantry through April as part of Intrinsic Action. The battalion was DS to the Army's division ready brigade for four months. The *Battlekings* completed the year with a November NTC rotation DS to the 2d *Spartan* Brigade.

1-10 FA deployed A Battery as part of Task Force 1-15 Infantry on 10 days' notice to Kuwait for Intrinsic Action.

The *Steel* Battalion deployed DS to the ready brigade mission from March to September. C Battery deployed as part of Task Force 1-30 Infantry in October to Bright Star.

1-41 FA went to the NTC in June and provided devastating fires for the 1st *Raider* BCT. *Glory's Guns* completed the year DS to the ready brigade.

A/13 FA (MLRS) completed two LFXs that included developing TTP for digital missions between the division cavalry



A/1-9 FA conducting a live-fire exercise in Kuwait during Intrinsic Action 99-01. (Photo by CPT Jim McGovern)

squadron's OH-58Ds and rocket launchers. The battery remains ready to deploy on short notice as the division's GS artillery. A/39 FA (TAB) upgraded to AN/TPQ-36 Version 8, increasing its radar capability and survivability.

As the new millennium approaches, the *Marne Division* stands ready to deploy with its Div Arty providing timely, accurate and lethal fires...because fire support is what we do! ***Marne Thunder!***

4th Infantry Division (Mechanized) Artillery

The *Iron Gunners* 4th Div Arty, Fort Hood, Texas, started 1999 on the heels of a successful Warfighter in December 1998. While modernizing to become Division XXI, we've had several opportunities this year to demonstrate our combat readiness.

The year started with an SFOR certification for the Division's attack aviation battalion that included live MLRS, Paladin, CAS and AH-64 fires. In March, the *Iron Gunners* digitally fought the entire team in a robust simulation exercise. In September, they linked simulations between Fort Hood and Fort Carson, Colorado, with live MLRS and AH-64 helicopter fires.

The Div Arty fielded AFATDS 98, common hardware/software-2 and ASIP radios, moving toward becoming the first digitized Div Arty in the Army.

The 4-42 FA *Straight Arrows* deployed to the NTC in March in support of the 1st BCT. It then demonstrated its exper-

tise by controlling the entire Div Arty for Ulchi Focus Lens. The *Straight Arrows* closed out the year fielding Force XXI battle command brigade and below (FBCB²).

Rolling Thunder 3-16 FA deployed to the NTC in May with the 2d BCT and its CAARNG 40th Infantry Div Arty teaming partner: 1-144 FA. It then sent a



A Paladin from 4-42 FA moves into position at the NTC. (Photo by SSG Richard Puckett, 13th Public Affairs Detachment)

battery to Kuwait for Intrinsic Action. A third deployment sent its headquarters and FSEs to Korea with the *Warhorse Brigade* in support of Fowl Eagle.

The *Pacesetters* 3-29 FA proved versatile in 1999. The battalion deployed to Pinon Canyon Training Area with the 3d BCT and then became the on-call force to battle wild land fires. 3-29 FA also served as the SFOR7 trainers and conducted an NTC train-up.

Deep Strike 2-20 FA in its first year deployed to the NTC as a reinforcing headquarters and completed a battalion EXEVAL and an NTC train-up. The battalion also reconfigured into 3x6 and integrated an MLRS battery from the Texas ARNG as its third firing battery.

The *Iron Gunners* remain a proud, competent, trained and ready team of warriors with leaders who care for soldiers and families and who are actively leading fires into the 21st century! ***Iron Gunners!***

SILHOUETTES OF STEEL

10th Mountain Division (Light Infantry) Artillery

The *Mountain Thunder* Redlegs of Fort Drum, New York, continued their aggressive training program and operational deployments in 1999. Our focus this year has been threefold: maintain operational readiness and warfighting skills; begin preparation for the Joint Contingency Force Advanced Warfighting experiment (JCF-AWE); and train, certify and deploy elements of the Div Arty to conduct peacekeeping operations in Bosnia-Herzegovina. Our training and operations provided challenging, dynamic opportunities for our young leaders.

The members of our *Mountain Thunder* team deployed to Great Britain, Panama, Bosnia-Herzegovina, Croatia and the Sinai in addition to conducting many battle-focused training missions at West Point and Fort Drum. 2-15 FA and elements of all other Div Arty units deployed to Bosnia-Herzegovina to conduct SFOR6 peacekeeping operations.



C/3-6 FA fires as part of an air assault during exercise Snow Centaur at Fort Drum.

The train-up included Div Arty individual replacement training (IRT) for the division and many exercises at Fort Drum, culminating in a demanding JRTC mission rehearsal exercise.

3-6 FA led the Div Arty's effort to prepare for next year's JCF-AWE. Many fire support initiatives, including a digitized light howitzer, radar-CAS linkage, improved situational awareness, multipurpose munitions, naval gunfire digital

interface and more effective FO systems are integral to 3-6 FA's participation. Using improved versions of AFATDS and synchronizing brigade task force tactical operations by integrating experimental digital systems are some of the challenges for 3-6 FA.

The Redlegs at Fort Drum continue to maintain their wartime skills and operational readiness via our outstanding *Mountain Thunder* training program: CALFEXs, Copperhead shoots, convoy and defensive live fires, air assaults,

EXEVALs, fire base operations with extensive fortification of the battery position, AFATDS fielding, FORSCOM's Field Connelly Competition and battery and battalion LFXs. We look forward to our rigorous training and focus on small-unit operations in 2000 as we continue to provide outstanding fire support to the 10th Mountain Division and the *Warrior, Commando* and *Falcon Brigades. Mountain Thunder!*

25th Infantry Division (Light) Artillery

Tropic Thunder Redlegs of the 25th Div Arty, Schofield Barracks, Hawaii, served with distinction around the globe this year.

3-7 FA *Never Broken* executed a superior rotation at the JRTC with the 3d BCT in a peace enforcement scenario. The battalion fought as both a DS FA battalion and maneuver unit during the rotation, receiving infantry and combat service support attachments. 3-7 FA with B/2-14 Aviation were the first in the Army to tandem rig and fly the Q-36 Version 8 radar and prime mover. Additionally, the battalion was the first to fire extended-range Charge 8 HE during a superior external gunnery evaluation at Pohakuloa Training Area (PTA) on the island of Hawaii.

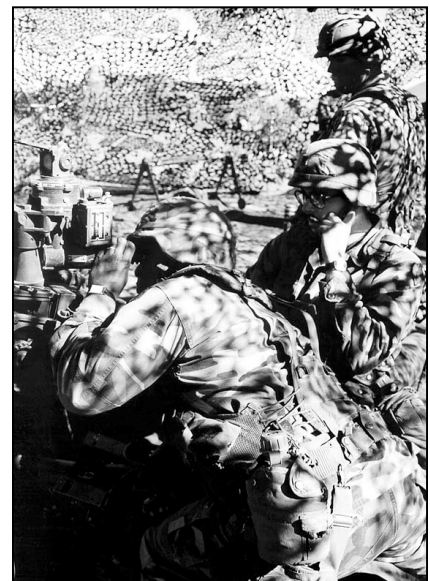
2-8 FA *Automatic* provided the 1st BCT exceptional fire support at Fort Lewis during the brigade's EXEVAL Aragon Lightning. Additionally, *Automatic* soldiers provided close fires during a heavy/light NTC rotation with a brigade of the 4th Infantry Division (Mechanized) from Fort Carson, Colorado.

The *On Time* 2-11 FA provided professional fire support to the 2d BCT in Hawaii and abroad. At the NTC, the battalion supported a light infantry task force in a successful live-fire attack and integrated fires with the 4th Division during force-on-force operations. At Cobra Gold 99 in Thailand, *On Time* executed a superb LFX with all services of both nations. Our soldiers also executed a ThunderEx rotation at PTA, massing fires and conducting air assault raids and direct fire and firebase operations. Finally, *On Time* conducted force-on-force maneuver operations in Alaska in Arctic Raider and then returned to the NTC in support of the OPFOR.

Our 25th FA Det trained at PTA to decrease sensor-to-shooter times as part of the Div Arty TOC. F/7 FA transitioned from a GSM198 1x8 battery to a 1x6 battery and then executed an EXEVAL.

At our Saint Barbara's tribute, we honored Congressional Medal of Honor recipient Colonel (Retired) Lewis L. Millet, a 25th Division company commander during the Korean War and former World War II FO. The 25th Div

Arty continues to provide accurate, timely and lethal fire support to the *Tropic Lightning Division* as its *Tropic Thunder!*



A 3-7 FA howitzer section chief checks sight and bubbles during a fire mission.

(Photo by SGT Marcia Triggs, 25ID (L) PAD NCOIC)

SILHOUETTES OF STEEL

28th Infantry Division (Mechanized) Artillery

The *Keystone Redlegs* of the 28th Division, PAARNG, had a landmark year. The Army recently designated our "teaming" partner the 3d Infantry Division (Mechanized) *Rock of the Marne*, Fort Stewart, Georgia, providing the total force link.

Div Arty and its FSEs to the brigade level executed a successful train-up and then a V Corps Warfighter exercise in Germany. *Keystone* soldiers employed the maneuver control system (MCS), Warlord, IFSAS and the tactical local area network (TACLAN) to full advantage. 28th Div Arty metro, radars from F/109 FA (TA) and survey proactively supported our units at multiple locations, both in CONUS and OCONUS.

1-107 FA and D/229 (GS) had a successful TY in Pennsylvania and Germany, leading to a productive AT. 1-107 FA fired live SEAD in a coordinated attack with the Air National Guard (A-10s and F-16s) in AT at Fort Indiantown Gap, a first for the battalion. D/229 FA underwent a rigorous TA model (TAM) from its training support battalion (TSBn) that also conducted informal lane training.

1-108 FA's successful TY culminated with AT at Fort Indiantown Gap focused on the FA Tables for battery qualifications. The battalion conducted training on movement, occupations and refuel, rearm, and resupply points (R³P) at night using night-vision goggles. The FSEs conducted joint operations with the Air Force (A-10s and F-16), using the M981 FISTV and GVLLD to execute CAS.

1-109 FA perfected year-long individual and section training with an excellent AT at Fort Pickett, Virginia. The training included conducting live hip shoots; integrating aerial observation of fires using FEDs with support from 2-104 Aviation; supporting 1-201 FA, WVARNG, during its Paladin NET; and conducting its first battery defense lane training.



A howitzer from the 28th Infantry Division Artillery basks in the sun—waiting for the order to kill something.

Div Arty units accomplished all the training in addition to Brigade Command and Battle Staff Training (BCBST). We also implemented the 3x6 platoon structure and fielded the M249 squad automatic weapons (SAWs) for battery defense.

Our training, sustaining and maintaining effort this year has made the *Keystone Redlegs*, again, **Charged to Excellence!**

29th Infantry Division (Light) Artillery

The 29th Div Arty, VAARNG, met a myriad of challenges head-on this year and performed in an outstanding manner. Most notable was its participation in a Warfighter exercise (ramp-up) at Fort Dix, New Jersey, and the 29th Division's Warfighter 99 exercise at Fort Leavenworth, Kansas. The division FSEs from Virginia, Maryland and Connecticut assembled an aggressive and knowledgeable team that helped the 29th ID (L) capture the OPFOR guidon.

2-110 FA (Pikesville, Maryland) enjoyed an excellent exercise along with its Div Arty counterparts during Warfighter 99. The battalion improved its readiness posture by increasing in strength and firing all Artillery Tables to standard at Fort Indiantown Gap, Pennsylvania.

1-246 FA (Danville, Virginia) supported the Div Arty mission by participating in all Warfighter 99 events. Si-

multaneously, it concentrated on developing individual, leader, section, battery and staff proficiency in its METL. Artillery Tables I - VIII were performed excellently during inactive duty training (IDT) and AT, accomplishing multi-echelon training.

2-192 FA (Westbrook, Connecticut) also played a major role in Warfighter 99. However, the battalion concurrently was in the "run phase" of transitioning

to the DS mission for the 26th Infantry Brigade. Artillery Tables I-VI were accomplished during IDTs and Tables VII and VIII were shot during AT at Fort Dix.

E/111 FA (Sandston, Virginia), the division's GS battery, focused on strength improvement and LFXs consisting of Tables I-VII. The battery successfully completed its mission and looks forward to a new MTOE early in TY00.

129 FA Det (TA) (Sandston) blessed with seasoned soldiers from their recent Bosnian deployment, performed many tasks to support the 29th Division Artillery. This year the detachment also worked hand-in-hand with the new 54th FA Brigade, VAARNG, providing real-world radar spotting and several digital communication exercises.

The 29th Div Arty is looking forward to meeting all challenges in the near future. **We Stand Ready!**



E/111 FA Redlegs take part in crew drill training on the M198.

SILHOUETTES OF STEEL

34th Infantry Division (Mechanized) Artillery

The 34th *Red Bull* Div Arty-Minnesota, Iowa and Wisconsin ARNG-this year continued working toward fulfilling its vision of being the best Div Arty in the ARNG. We continued to support our NATO missions as well as sustained the readiness of our wartime priority units. Major training highlights included participating in the 34th Division's Corps Battle Simu-

lation (CBS) exercise in June, providing support for maneuver brigade battle simulations and conducting an aggressive AT for our separate batteries. The Div Arty separate battery AT included training support battalion (TSBn) lanes for F/151 FA (155 SP). E/151 FA (TA) provided radar support during four ATs while HHB provided meteorological support for all FA battalion ATs.

1-120 FA (WIARNG) continued its integration into the 34th Div Arty during TY 99 and underwent an aggressive AT in June. It focused on firing battery lanes, as well as a live-fire CAS mission at Fort McCoy, Wisconsin.

1-125 FA (MNARNG) continued to serve in its dual-mission status as the DS battalion to the 1st Brigade and also as part of the NATO Composite Force. The unit completed a battalion

staff with one firing battery rotation to Norway in February and a successful AT for the remainder of the battalion in August, which included a TSBn administered firing battery lane.

Our sister MNARNG 151 FA, a corps battalion, continued to fulfill its role as the state's only force support package (FSP) battalion. The battalion's aggressive training included lanes administered by a TSBn as well as CSS lanes during AT. The battalion began converting to its new MTOE, which includes a combined headquarters and service battery, and transitioned to platoon operations.

The 1-194 FA (IAARNG), DS to 2d Brigade had a demanding training plan for TY 99. It continued to improve its proficiency in air assault operations and participated in the 2d Brigade Janus exercise in April. The battalion's AT focused on lanes: air assault, firing battery and NBC operations.

The 34th Div Arty stands ready to meet the challenges of the 21st century and continues to be a proud and relevant partner in America's Army-ready to **Attack! Attack! Attack!**



C/1-151 FA stands ready for a fire mission during TSBn administered lanes at Camp Ripley, Minnesota, during AT 99.

35th Infantry Division (Mechanized) Artillery

The 35th *Santa Fe* Division Artillery, with its headquarters in the Kansas Army National Guard and other units in the Illinois and Kentucky Guard, had an excellent training year. Div Arty units conducted digital training and supported two Brigade/Battalion Battle Simulation (BBS) exercises. The Div Arty and its DS and GS units supported the 149th Armor Brigade and 67th Infantry Brigade BBS training exercises during the year.

The Div Arty executed an aggressive consolidated AT at Fort Riley in June. Integral to the success of the AT were 1-161 FA (DS) of Kansas, F/161 FA (GS) of Kansas, 2-122 FA (DS) of Illinois, E/161 FA (TA) of Kansas, 1-127 FA (130th FA Brigade) of Kansas, 127th Weather Flight (35th Division) of Kansas, 135th Signal Battalion (35th Division) of Nebraska, and the 35th Division Support Command (DISCOM) of Missouri. This event provided many successful multi-echelon training events. 2-138 FA (DS) of Kentucky conducted sec-

tion- and battery-level lane training at Camp Atterberry, Indiana, during AT.

The Div Arty continues to make its number one priority strength management while making training more chal-

lenging to the soldiers of the *Santa Fe* Div Arty. We also are working with our sister unit, the 130th FA Brigade (Topeka) to hone our warfighting skills through a joint effort at the I Corps CPX.

The Division FSE has attended Lucky Warrior and Blue Flag exercises to hone its warfighting skills during the past year.

The Div Arty and 130th FA Brigade will co-host the third annual 35th Div Arty/130th FA Brigade Fire Support Conference in November. This event will update battery- and battalion-level leaders across the two units on current FA doctrine, equipment and fire support TTP for the upcoming 35th Division Warfighter in TY 2000. The 35th Div Arty is concentrating heavily on the use of fires-based maneuver and its impact on FA planning and fire support execution for the Warfighter.

The 35th Div Arty stands trained and ready to meet the challenges of the future and provide unparalleled fire support to the ***Santa Fe Division!***



During annual training at Fort Riley, Kansas, members of 2-122 FA, ILARNG, conduct an artillery raid.

(Photo by MAJ John Nondorf)

SILHOUETTES OF STEEL

38th Infantry Division (Mechanized) Artillery

The Redlegs of the 38th Div Arty, INARNG, headquartered in Indianapolis, have seen yet another exciting year. HHB and E/139 FA (TA) throughout the fall and winter prepared orders and training for an artillery Brigade Command Battle Staff Training (BCBST) exercise. Although the exercise was cancelled, our units used the work in progress as the basis for our AT scenario and as a means of honing FA skills.

The 1-119 FA, headquartered in Lansing, Michigan, and 1-134 FA, Columbus, Ohio, planned and conducted an integrated, intense three-state AT at Camp Grayling, Michigan. The battalions proved they have the skills and initiative to provide outstanding support for our mechanized and armored brigades.

The 2-150 FA (155-mm, towed), a corps battalion headquartered in Bloomington, Indiana, was decisively engaged in two missions this year. First was the attachment of Battery A to the 1-163 FA DS to the 76th Infantry Brigade (Sep) for its JRTC rotation. The

second event was reorganization to 3x6. Although tube strength and platoon configuration remained, the 2-150 FA staff and commander worked diligently to find jobs for all the soldiers. During AT,



This 1-134 FAM109 is "On the Road Again," participating in a three-state AT.

the battalion successfully operated in both GS and GSR roles, including firing three Copperhead rounds.

The 3-139 FA also had an active year. During two separate snow emergencies, it provided personnel and equipment to civil authorities to assist motorists. It also provided 55 soldiers to the 29th Infantry Brigade (Sep) for its JRTC rotation. In addition, 3-139 FA worked closely with Div Arty to provide fire support personnel to the 1-163 FA for the JRTC, all the while preparing for its own AT.

The Div Arty capped off the year by managing a successful AT at Camp Grayling, involving four artillery battalions, our TA battery, a signal (MSE) element, our support slice, an engineer company, an aviation lift company and the 1-246 Armor Battalion. We also hosted three Slovak Republic artillery officers from Indiana's Partners for Peace partner to observe our training.

As we approach the new century, the Div Arty looks forward to new challenges and honing the warfighting skills of the 34th Division- *Cyclone's Thunder!*

40th Infantry Division (Mechanized) Artillery

The 40th Div Arty, California ARNG, continued to make history in 1999. D/144 FA, our GS battery, was the first National Guard unit to live fire as part of an Active Component (AC) NTC rotation. 1-144 FA was the first National Guard battalion to send its TOC to serve as a reinforcing battalion and counterfire headquarters during an AC NTC rotation. The success of these tremendous citizen soldiers and leaders was a direct result of "teaming" with the 4th Infantry Division (Mechanized), Fort Hood, Texas.

The 40th Div Arty is using today's technology to train and care for its soldiers located more than 500 miles apart. The Div Arty conducts "dim night" meetings (electronic dark nights) and provides a website (www.40divarty.com), saving our leaders hours on the road and improving communications.

The year has been exciting and challenging with the Div Arty focused on section-level training. Our ATs were conducted in three major areas. First, D/1-144 FA and 1-144 FA firing batteries participated as OPFOR artillery and

then transitioned to BLUFOR (friendly force) for live fire at the NTC while the 1-144 FA O&I served as the reinforcing TOC for 3-16 FA, 4th Div Arty.

1-143 FA conducted Operation Steel Maker at Camp Roberts focused on section lanes, culminating its AT with tactically realistic battery evaluations administered by Div Arty. 1-143 FA refined this process and validated its baseline training. In May 2000, 1-144 FA will receive its battery evaluations in conjunction with a deployment to the MCAGCC at Twentynine Palms.

Our third AT sent the division FSE to Fort Bliss, Texas, as part of the joint and combined theater missile defense exercise Roving Sands where the 40th Division served as the Army forces headquarters (ARFOR). The FSE introduced the operational fires element (OFE), a joint version of the deep operations coordination cell (DOCC) that included an air tasking order (ATO) team concept.

The talented, dedicated citizen soldiers of the 40th Infantry Div Arty will meet every challenge in the new century. *Steel Lightning!*



A 40th Infantry Division howitzer rumbles across the desert floor at the NTC.

SILHOUETTES OF STEEL

42d Infantry Division (Mechanized) Artillery

This year proved exciting for the cannoners of the 42d Infantry *Rainbow* Division (Mechanized) Artillery, MAARNG. Headquartered in Rehoboth, Redlegs from HHB Div Arty played an integral role in support of the I Corps Warfighter exercise, Cascade Mist, at Fort Lewis, Washington.

Despite having no local training areas to conduct live-fire exercises, 1/101 FA (DS) (M109A5), New Bedford, conducted several multiple-unit training assembly (MUTA) 6s, traveling to Fort Dix, New Jersey, and Fort Drum, New York, to maintain crew proficiency. During AT 99, all battalion and battery METLs were rated "Trained." The battalion's training culminated with a three-day direct fire rotation, accomplishing FA Tables VII-IV, as well as firing Copperhead.

1-258 FA (DS) (M109A5), Jamaica, New York, mastered digital fire control dur-

ing its AT. Last year, it received IFSAS and the forward entry device (FED). Selected members of the battalion visited the NTC for leader training. Firing FA Table VIII topped off AT for our New York Redlegs.

Highlights for 3-112 FA (GS) (M109A5), Morristown, New Jersey, included completing an FA enhanced training experiment (FAETE) that combined howitzer crew trainers, battle simulations and an

FA live-fire exercise. In addition, 3-112 FA provided the logistical resources and FA gunnery team for the 101st FA Regional Training Institute, MAARNG, to conduct live-fire training as part of its 13B MOS course certification.

After returning from a deployment to Bosnia-Herzegovina in TY98, E/101 FA (TAB) (Q-36/37), Rehoboth, focused on maintaining strength readiness. Battery E not only provided TA support to the 42d Div Arty during AT, it also supported the 1-102 FA (M109A5), MAARNG (part of the 113th FA Brigade, HHB, NCARNG), as well as the 197th FA Brigade, NHARNG. Its final mission of the year placed it at Fort Leavenworth, Kansas, participating in the 29th Infantry Division (Light) War-fighter.

Rainbow Redlegs end the millenium as trained artilleryists prepared to support the force of the 21st century. **Redleg Thunder!**



C/1-258 FA at Fort Drum during AT 99.

49th Armored Division Artillery

The 49th Div Arty, TXARNG, has gained another battalion, 2-131 FA (MLRS), to add to our three DS M109A5 howitzer battalions. 2-131 FA's three MLRS batteries each are aligned with AC divisional MLRS battalions in the 4th Infantry (Mechanized) and 1st Cavalry Divisions, both at Fort Hood, Texas, and the 3d Infantry Division (Mechanized) at Fort Stewart, Georgia.

B/2-131 FA has been training with 2-20 (MLRS), 4th ID. It will deploy with the Division to the NTC next year. C/2-131 FA conducted its two-week AT with 1-21 (MLRS) of the 1st Cav. The 1-21 S3 and master gunner integrated the battery into its training for equipment familiarization, battery and platoon operations and ammo load and reloads. The battery completed FA Table VIII, launching rockets.

Members of the FSE and selected soldiers throughout the Div Arty are training with the Division (SFOR7) in preparation for its historic deployment early next year as part of the NATO peacekeeping mission in Bosnia-Herzegovina.

The DS battalions continued performance-oriented and mission-focused lane training this TY. By sustaining skills on IFSAS, they executed fire missions digitally during AT, including receiving radar and meteo-

rological data digitally. For AT, the Div Arty staff prepared and conducted a TOC exercise-conducting briefings, preparing a METL and developing an OPORD.

The 4-133 FA and A/2-131 FA (TA) deployed to Fort Bliss, Texas, for their AT. The battalion also supported an MOS-qualified (MOSQ) producing school with the state academy, training 60 soldiers, including in MOS 13B, 13F and 13E.

The Div Arty helped state residents during major flooding in October 1998. The TXARNG performed more than 11,000 man-days of state active duty, rescued more than 230 flood victims by air and hundreds more in high-riding five-ton trucks and dropped more than 1.5 million gallons of water on wildfires. 49th Div Arty's MSG James Roguski and MSG Robert Strzelczyk were awarded the Lone Star Medal of Valor, the state's second highest award for bravery, for heroic actions during rescue operations.

The 49th Div Arty stands ready to accomplish the mission-in Texas flooding or Bosnia peacekeeping- **Balls of Fire!**



The 49th Div Arty's new C/2-131 FA (MLRS) trains with its dual-component unit, the 1-21 FA, 1st Cav, during AT.

SILHOUETTES OF STEEL

82d Airborne Division Artillery

The paratroopers of the 82d Airborne Div Arty at Fort Bragg, North Carolina, remain ready to deploy "no-notice" worldwide and provide timely, accurate fire support to the *All-American Division*. In April, the call came for C/1-319 Airborne FA Regiment (AFAR) to deploy to the Balkans in support of NATO operations. After the air campaign against Serbia, C Battery and the 2-505d Parachute Infantry Regiment (PIR) were the first US units to enter Kosovo.

1999 was a year of intense training challenges in which all three cannon battalions deployed to a CTC. The *Loyalty Battalion*, 1-319th AFAR, deployed to the JRTC with the 3d Brigade and executed a highly successful rotation. *Falcon's Fury*, 2-319th AFAR, deployed to the NTC in January as the composite force FA headquarters and provided decisive fires in support of the 2d Brigade's light-heavy rotation. In August, the *Gun Devils*, 3-319th AFAR went to the JRTC and provided superb fire support to our 1st Brigade. Time after time, the paratroopers of the 319th

AFAR expertly integrated fires into the close fight and-at the expense of ill-fated OPFOR units-proved why artillery is the biggest killer on the battlefield.

Live-fire and CALFEX training exceeded all expectations at Fort Bragg. Our cannons fired over 35,000 rounds in 1999. The majority of these rounds impacted at minimum safe distances to maneuvering troops during CALFEXs. Integrating indirect fire systems into the scheme of maneuver at the infantry company and battalion level is the top live-fire training event for our units.

The regiment fielded the Q-36 Version 8 radar and the gun-laying and positioning system (GLPS). These systems, combined with AFATDS, help the 319th provide flexible solutions for fire support for the 82d Division. In early 2000,



82d Airborne Redlegs shooting rounds in support of their fellow paratroopers.

the regiment will field the next generation of AFATDS, further enhancing our ability to support division operations.

The 319th's dedicated paratroopers remain the centerpiece of the *All-American* fire support system. Our airborne gunners proudly reflect the legacy of the Army's most decorated artillery regiment and renew their service pledge every time they "hook-up" and exit an aircraft. ***Airborne - Loyalty - All the Way!***

101st Airborne Division (Air Assault) Artillery

The 101st Airborne Div Arty (Air Assault) at Fort Campbell, Kentucky, trained under demanding, realistic conditions and deployed worldwide in support of contingencies in Honduras, the Balkans and the Middle East this year. We also served as the Army Force FA Headquarters during the XVIII Airborne Corps' Warfighter and fielded AFATDS.

In November 1998, 1-320 FA *Top Guns* manned the Div Arty DS artillery cell during the successful Corps Warfighter, *Fuertes Defensas*. Further, during division-level Mega Gold exercises, the battalion provided devastating fires for two brigade air assault operations to take down forward landing strips at Fort Knox, Kentucky, in January and Greenville Military Training Area, also in Kentucky, in May. Additionally, the battalion completed an EXEVAL with all missions fired digitally via AFATDS.

2-320 FA *Balls of the Eagle* fired 10,000 rounds in support of two CTC rotations and other off-post deployments, SEAD missions and many

infantry LFXs, including a JAAT mission. The battalion deployed to the NTC in late 1998 and then to the JRTC in September 1999. It also provided fire support to elements of the 1st Brigade Combat Team at Fort Pickett, Virginia; Camp Atterbury, Indiana; and Greenville.

The 3-320 FA *Red Knights* fielded AFATDS and deployed to the JRTC.



101st Redlegs conducting air assault operations.

The battalion achieved a significant milestone by having 92 percent of its soldiers and officers air assault qualified, setting the tone of professionalism for a great year. In October, the Div Arty evaluated the battalion during the Eagle Fires IV that measured the unit's speed, accuracy and procedures for delivering fires and its air assault and aerial resupply skills. In July and August, the *Red Knights* again used aviation assets to conduct 30 deliberate air assaults and battery raids and deliver over 80 percent of its supply loads. The battalion also supported the *Rakkasans* brigade task force air assault from Fort Campbell to Greenville.

The 2d FA Detachment (2 FAD) *Guardians* air loaded a Q-37 radar onto a C-130 at Greenville and air assaulted the radar at night. In addition, 2 FAD participated in three convoy LFXs.

The 101st Airborne Div Arty is ready to deploy anywhere, anytime in support of the *Screaming Eagles*-prepared for our next rendezvous with destiny. ***Air Assault!***

SILHOUETTES OF STEEL

10th Marine Regiment

As the 2d Marine Division's *Arm Of Decision*, the 10th Marines, Camp Lejeune, North Carolina, conducted extensive joint/combined operations during FY99 in Norway; the Mediterranean Sea; Okinawa, Japan; and CONUS. The regiment also provided batteries to the battalion landing teams of the 22d, 24th and 26th Marine Expeditionary Units (MEUs) (SOC) and the unit deployment program (UDP), which supports the 3d Marine Division on Okinawa.

Express Sword, the semiannual regimental field firing exercise at Fort Bragg, North Carolina, was conducted during October and April. These exercises integrated the Army's XVIII Airborne Corps Artillery MLRS CPX, 4/14 from the Marine Reserves in Alabama and Army rotary wing and Marine fixed wing sorties.

The regiment also conducted a Y2K evaluation of fire support systems as part of the Marine Corps Operational Test and Evaluation Activity's (MCOTEA's) ongoing "thin line evalua-

tion" in preparation for the new millennium.



Cannoneers answering calls for fire during a CAX at Twentynine Palms, California.

1st Battalion deployed to Turkey and participated in exercise Dynamic Mix during October. Cold weather operations were conducted at the Mountain Warfare Training Center, Bridgeport, California, and the 1st Battalion subsequently deployed to Norway for joint/combined Operation Battle Griffin. In August, 1st Battalion deployed to the MCAGCC, Twentynine Palms, California, to support Combined Arms Exercise (CAX) 9/10-99 while the remainder of the regiment prepared for Express Sword in October.

In January, the 3d Battalion conducted two CAXs at MCAGCC in support of CAX 3/4-99. 2d Battalion and elements of 5th Battalion conducted extensive planning for potential deployments to a variety of areas, including Cuba, Honduras and the Balkans.

The regiment celebrated its 85th birthday in April. As the 10th Marines, we continue to uphold our legacy as the oldest artillery regiment in the Marine Corps, serving as the 2d Marine Division's *Arm of Decision!*

11th Marine Regiment

Throughout 1999, the 11th Marines *Cannon Cockers*, 1st Marine Division, Camp Pendleton, California, (1-11, 2-11 and 5-11) with one battalion (3-11) at Twentynine Palms, California, supported a broad repertoire of deployments, exercises, technology demonstrations and the occasional contingency. The regiment

supported five deployments to the Western Pacific with the 11th, 13th, 15th and 31st MEUs as well as one in support of the 3d Marine Division. Training exercises occurred in Okinawa, Hong Kong, Singapore, Oman, United Arab Emirate, Qatar, Kuwait and Jordan.

Closer to home, the regiment pursued METL excellence with back-to-back exercises.

Four CAXs conducted at MCAGCC refined digital sensor-to-shooter procedures while all fire support assets fired live ordnance in close proximity to maneuver units. The live-fire and maneuver exercise Steel Knight practiced maritime pre-positioned operations in a notional regional contingency. An entire FA battalion participated in an amphibious assault-Kernal Blitz and AOT 99, both at Camp Pendleton.

Two Desert Fire Exercises were expanded to com-

bined arms and maneuver exercises at MCAGCC to simulate employing an artillery regiment in division operations. In addition to infantry, the exercises included an MLRS battalion and five M198 battalions. More than 20,000 artillery rounds, 190 rockets and 400 fixed and rotary wing sorties were employed.

In Ulchi Focus Lens, a CINC-level exercise, the regiment honed its staff planning skills and habitual relationships with go-to-war higher and supported staffs. We also participated in seven tactical air control party (TACP) shoots, two weapons training instructor (WTI) shoots and five Fallbrook shoots.

The 11th Marines also demonstrated and tested future equipment: AFATDS software in a smaller lightweight package; sea trials of ship-to-shore digital communications with AFATDS mounted in the *USS Bon Homme Richard* (LHD-6); and the 120-mm box mortar for the Marine Corps Warfighting Lab.

The 11th Marine Regiment continues to lean forward in support of real-world commitments and cutting edge technology and doctrine- *Cannon Cockers!*



11th Marines at Twentynine Palms, California.

SILHOUETTES OF STEEL

12th Marine Regiment

The 12th Marine Regiment, the Marine Corps' forward-deployed artillery regiment, is headquartered on Okinawa, Japan, with one battalion in Okinawa and one in Hawaii. This year, elements of the 12th Marines trained on mainland Japan, Okinawa, Hawaii, South Korea, Guam, Australia and Thailand-spanning the Pacific Theater.

In January, 12th Marines deployed to the Pohakuloa Training Area (PTA) on the big island of Hawaii to support the 3d Marine Division in Pacific Impact 99.

A major combined-arms live-fire exercise, this was the first opportunity in years for the two battalions and the regimental headquarters to train together. Pacific Impact dovetailed with 1/12's participation in the 3d Marine Regiment's Hawaii Combined Arms Operations and included active and Reserve Marines as well as soldiers and aircraft from the 25th Infantry Division (Light) from Schofield Barracks.



12th Marines, Okinawa, doing what they do best!

In addition to participating in Pacific Impact, 1/12 and 3/12 each deployed for two other battalion-level operations. 1/12 again deployed to PTA in June/July and, in September/October, married up with equipment from a maritime prepositioned force (MPF) ship to fire in Australia for Crocodile. 3/12 and the 12th Marines Regimental combat operations center (COCC) deployed in March/April to Camp Fuji, Japan, for a

combined-arms LFX, and the battalion deployed in September to the island of Hokkaido in northern Japan for a battalion fire exercise.

In 1997, all artillery firing was relocated from Okinawa with the Government of Japan annually financing four artillery relocation exercises and the 3d Marine Division funding the remaining shoots. Accordingly, Okinawa-based 12th Marines batteries deployed to mainland Japan eight times this year for live-fire exercises, and a battery deployed to Thailand in May to participate in Cobra Gold 99. This was the first time Marine artillery had fired in Thailand in several years.

This past summer, two AN/TPQ-46 radars (Q-36 Firefinder, Version 7) formerly attached to 1/12 in Hawaii were transferred to Okinawa. This consolidates all counterbattery radar sets at the regiment.

Forward deployed and on the go throughout the Pacific Theater, the 12th Marine Regiment remains America's **Thunder and Steel!**

14th Marine Regiment

The 14th Marines, with its headquarters at Naval Air Station, Joint Reserve Base, Fort Worth, Texas, is the Marine Corps' largest regiment and the only Marine Reserve artillery regiment. The five battalions and 15 firing batteries in the 14th Marines are spread over 19 cities and 13 states. With mobilization and mission readiness the priority, the 14th Marines participated in many exercises throughout the year.

Express Sword 2-99 at Fort Bragg, North Carolina, featured 4/14 reinforced with C/1/14, augmenting 10th Marines during the live-fire regimental exercise. 5/14 continued the total force training by participating in DESFIREX 2-99 in Twentynine Palms, California, with the 11th Marines. 3/14 and 5/14 further honed their combat skills when they refined fire support TTP during a rotation through the Combined Arms Exercise (CAX) 8-99 at Twentynine Palms.

Headquarters, 1/14 demonstrated its versatility across the training spectrum when it successfully participated in the Marine Corps' Urban Warrior Advanced Warfighting Experiment in March. Two

other unique training exercises featured units from the 14th Marines: E/2/14 participated in Resolute Warrior at Fort Knox, Kentucky, and N/5/14 flew to Hawaii to participate in a CAX with units from the 12th Marines.

The capstone exercise for the 14th Marines was Maximum Force 99, Fort Carson, Colorado, in July. During this exercise, 14th Marines Headquarters, 1/14, 2/14 and 2-4 FA (MLRS) conducted battery, regimental and force FA headquarters operations. Combat Service Support Det-45 provided all logistical support for more than 700 pieces of rolling stock moved from nine different geographical locations on 131 rail cars to Fort Carson. Concurrently being conducted with Maximum Force 99 was I

MEF's MEFEX at Camp Pendleton, California. The 14th Marines' regimental liaison team participated in the MEFEX, refining our ability to serve as I MEF's force FA headquarters during Ulchi Focus Lens in Korea.

As 14th Marines, we continue to build on our proud tradition and remain **At the Ready!**



The 14th Marines, shown here in a live-fire exercise, make mission readiness a priority.

1999 Redleg Reference

The following is a list of articles and selected items from "From the Firebase" (FF), "Incoming" (INC) and "Redleg Review" (RR) appearing in *Field Artillery* during calendar year 1999. The entries are categorized by subject and listed chronologically by title and edition.

Unit Reports

- "XVIII Airborne Corps: Fires for Forced-Entry Operations" (Interview with LTG William F. Kernan, Commanding General, XVIII Airborne Corps), Jan-Feb
- "Fire Support Challenges in Arctic Operations" (4-11 FA, 172d Sep IN Bde), Jan-Feb
- "HIMARS, Firepower for Early Entry Forces" (3-27 FA, 18th FA Bde), Jan-Feb
- "Rakkasan's COLT Sergeant Tim Andrews-Hero of the JRTC" (3-230 FA, 101st Abn (A Aslt) Div Arty), Jan-Feb
- "Operation Desert Thunder and the Force FA Headquarters" (3d ID (Mech) Div Arty), Jan-Feb
- "3x6 Operations in the Paladin Battery" (2-82 FA, 1st Cav Div Arty), Mar-Apr
- "Training and Maintaining AFATDS the Red Team Way" (1st Cav Div Arty), Mar-Apr
- "Breach Blocks Painted Bright Red: Task Force Smith in Korea" (52d FAB, 7th IN Div), Jul-Aug
- "Walk a Mile in My Shoes: AC-RC Team Building" (1-141 FA, 256th IN Sep Bde), Sep-Oct
- "14th Marine Regiment-The Marine Reserve Artillery," Sep-Oct
- "AC Training Support Brigade Assistance for RC Redlegs" (1st TSBn (MLRS), 479th TSB FA), Sep-Oct
- "Thinking 'Out of the Box'-Baseline Training for the ARNG" (40th IN Div Arty, CAARNG), Sep-Oct
- "Distance Learning-MLRS 3x6 Conversion for the Army National Guard" (2-147 FA, SDARNG), Sep-Oct
- "Silhouettes of Steel" (Reports by Total Army Corps Artys and Div Artys and Marine FA Regiments), Nov-Dec

Targeting/TA

- "Targeting on the LIC and PKO Battlefield: A Paradigm Shift," Jan-Feb
- "Un-Masking the Q-36 Mask Angle: Finding Mortars in the Woods," Jan-Feb
- "New Career Path for the FA Targeting Technician 131A," May-Jun

Doctrine and TTP

- "XVIII Airborne Corps: Fires for Forced-Entry Operations" (Interview with LTG William F. Kernan, Commanding General, XVIII Airborne Corps), Jan-Feb
- "Fire Support Challenges in Arctic Operations," Jan-Feb
- "HIMARS, Firepower for Early Entry Forces," Jan-Feb
- "Linking the FA METL to Brigade TF Success," Jan-Feb
- "Fires for Future Amphibious Operations: OMFTS," Jan-Feb
- "Leader Checks on the Gun Line: Teaching New Dogs Old Tricks," Jan-Feb
- "Un-Masking the Q-36 Mask Angle: Finding Mortars in the Woods," Jan-Feb
- "Operation Desert Thunder and the Force FA Headquarters," Jan-Feb
- "Defensive Fires for the Light Force Brigade Rear," Jan-Feb
- "3x6 Operations in the Paladin Battery," Mar-Apr
- "Fire Support Planning for the Brigade and Below," Mar-Apr
- "The FA Wargame Synchronization Matrix," Mar-Apr
- "Deliberate NFA Sizing for Combat," Mar-Apr
- "6400-Mil Operations: Timely Fires in All Directions," May-Jun
- "Field Artillery-Relevant, Trained and Ready" (FF), Sep-Oct
- "Is the FA Walking Away from the Close Fight?" Sep-Oct
- "Thinking 'Out of the Box'-Baseline Training for the ARNG," Sep-Oct

Personnel/Force Structure

- "XVIII Airborne Corps: Fires for Forced-Entry Operations" (Interview with LTG William F. Kernan, Commanding General, XVIII Airborne Corps), Jan-Feb
- "Field Artillery Conversions to 3x6," Jan-Feb

- "Rakkasan's COLT Sergeant Tim Andrews-Hero of the JRTC," Jan-Feb
- "Operation Desert Thunder and the Force FA Headquarters," Jan-Feb
- "So...You Want to be a Drill Sergeant?" Mar-Apr
- "OCS Hall of Fame," Mar-Apr
- "New Career Path for the FA Targeting Technician 131A," May-Jun
- "Chiefs of Field Artillery, 1918 to Present" and "Fort Sill Sergeants Major, 1959 to Present," Jul-Aug
- "Army National Guard Fires," Sep-Oct
- "Walk a Mile in My Shoes: AC-RC Team Building," Sep-Oct
- "14th Marine Regiment-The Marine Reserve Artillery," Sep-Oct
- "AC-RC Integration-Seamless Land Power for the 21st Century," Sep-Oct
- "Field Artillery Training Command Directory," Nov-Dec
- "US FA Units Worldwide" (Maps of Army and Marine FA AC and RC Units, Separate Batteries and Above), Nov-Dec
- "US FA Commanders and Command Sergeants Major," Nov-Dec
- "Assessing the Branch" (FF), Nov-Dec

Leadership

- "Leader Checks on the Gun Line: Teaching New Dogs Old Tricks," Jan-Feb
- "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit," Mar-Apr
- "Army Values: The Essence of Leadership" (FF), May-Jun
- "Leadership: Turning Challenges into Opportunities," May-Jun
- "FA Leaders Lane Training," May-Jun
- "Top Ten Traits for Future Leaders," May-Jun
- "Counseling: Setting the Conditions for Junior Officer Success," May-Jun
- "Leading in the Three-Meter Zone," May-Jun
- "Tapping into Lieutenant Power for a High-Performing Battalion," May-Jun
- "Some Thoughts on Troop Leading," May-Jun
- "My Boss," May-Jun
- "Set 'Em Up for Success," May-Jun
- "Leadership is Leadership, Regardless of Gender," May-Jun
- "About the May-June Leadership Edition" (INC), Jul-Aug

"We Were Soldiers Once...The Battles of Ia Drang, 1965" (Interview with LTG(R) Harold G. Moore, author of *We Were Soldiers Once...and Young*), Jul-Aug

"Chiefs of Field Artillery, 1918-Present" and "Fort Sill Sergeants Major, 1959-Present," Jul-Aug

"Honor, Courage, Commitment-Not Just Words," Jul-Aug

"Crusader NCO Council," Sep-Oct

History

"The Century of Firepower, Part II," Mar-Apr

"Field Artillery History: Elements of a Trajectory" (FF), Jul-Aug

"Web Sources for Military History," Jul-Aug

"1998 History Contest Winner Places Nationally" (INC), Jul-Aug

"We Were Soldiers Once...The Battles of Ia Drang, 1965" (Interview with LTG(R) Harold G. Moore, author of *We Were Soldiers Once...and Young*), Jul-Aug

"Confederate Redlegs at Shiloh: Swatting the Hornet's Nest," Jul-Aug

"The Operational Use of Artillery in the War of Granada, 1482-1492," Jul-Aug

"Marine and Army Artillery-Forging a Lasting Relationship," Jul-Aug

"One Man's Vision: The Evolution of Airmobile Artillery," Jul-Aug

"The Memoirs of an Artillery Forward Observer, 1944-1945" (RR), Jul-Aug

"Breach Blocks Painted Bright Red: Task Force Smith in Korea" Jul-Aug

"2000 History Writing Contest Rules," Jul-Aug

"The Enubuj Experiment-US Army Tube Artillery at Kwajalein Atoll," Jul-Aug

"From Horses to Tractors-Implications for Army XXI," Nov-Dec

Equipment and Technology

"Force Modernization.It isn't Just for Heavy Forces Anymore," (FF) Jan-Feb

"XVIII Airborne Corps: Fires for Forced-Entry Operations" (Interview with LTG William F. Kernan, CG, XVIII Airborne Corps), Jan-Feb

"Field Artillery Conversions to 3x6," Jan-Feb

"HIMARS, Firepower for Early Entry Forces," Jan-Feb

"Fires for Future Amphibious Operations: OMFTS," Jan-Feb

"Leader Checks on the Gun Line: Teaching New Dogs Old Tricks," Jan-Feb

"Un-Masking the Q-36 Mask Angle: Finding Mortars in the Woods," Jan-Feb

"Training and Maintaining AFATDS the Red Team Way," Mar-Apr

"Tactical Targets from National Assets: The Precision SIGINT Targeting System," May-Jun

"Army National Guard Fires," Sep-Oct

"Space + Fires = No Where to Hide in 21st Century Land Force Operations," Sep-Oct

"FSCATT for the Gunnery Team," Sep-Oct

"Distance Learning-MLRS 3x6 Conversion for the Army National Guard," Sep-Oct

"ARNG Paladin NET-Helping Units Help Themselves," Sep-Oct

"Redleg Email Lists: Virtual FA Conferences," Nov-Dec

"Crusader Report to Congress," Nov-Dec

Training

"IET: Where Values and Excellence Begin" (FF), Mar-Apr

"IET: Starting the Soldier Out Right" (Interview with LTG William J. Bolt, DCG of TRADOC for IET), Mar-Apr

"So...You Want to be a Drill Sergeant?" Mar-Apr

"Honor, Courage, Commitment: Transformation to a Marine," Mar-Apr

"Rites of Passage: Civilian to Soldier," Mar-Apr

"Training and Maintaining AFATDS the Red Team Way," Mar-Apr

"OBC: Training the New Lieutenant," Mar-Apr

"Army Values and Basic Training," Mar-Apr

"FA Leaders Lane Training," May-Jun

"New Wine in New Bottles-Revitalizing Battle Staff Training," May-Jun

"Field Artillery-Relevant, Trained and Ready" (FF), Sep-Oct

"Wanted: DSTATS Scenarios" (INC), Sep-Oct

"AC Training Support Brigade Assistance for RC Redlegs," Sep-Oct

"Thinking 'Out of the Box'-Baseline Training for the ARNG," Sep-Oct

"FSCATT for the Gunnery Team," Sep-Oct

"Distance Learning-MLRS 3x6 Conversion for the Army National Guard," Sep-Oct

"ARNG Paladin NET-Helping Units Help Themselves," Sep-Oct

"Captains Professional Military Education: New Technology for the New Millennium," Nov-Dec

Joint/Combined Arms

"Redefining 'Jointness' for the 21st Century" (Interview with LTG Edward G. Anderson III, J5, Joint Staff), Nov-Dec

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