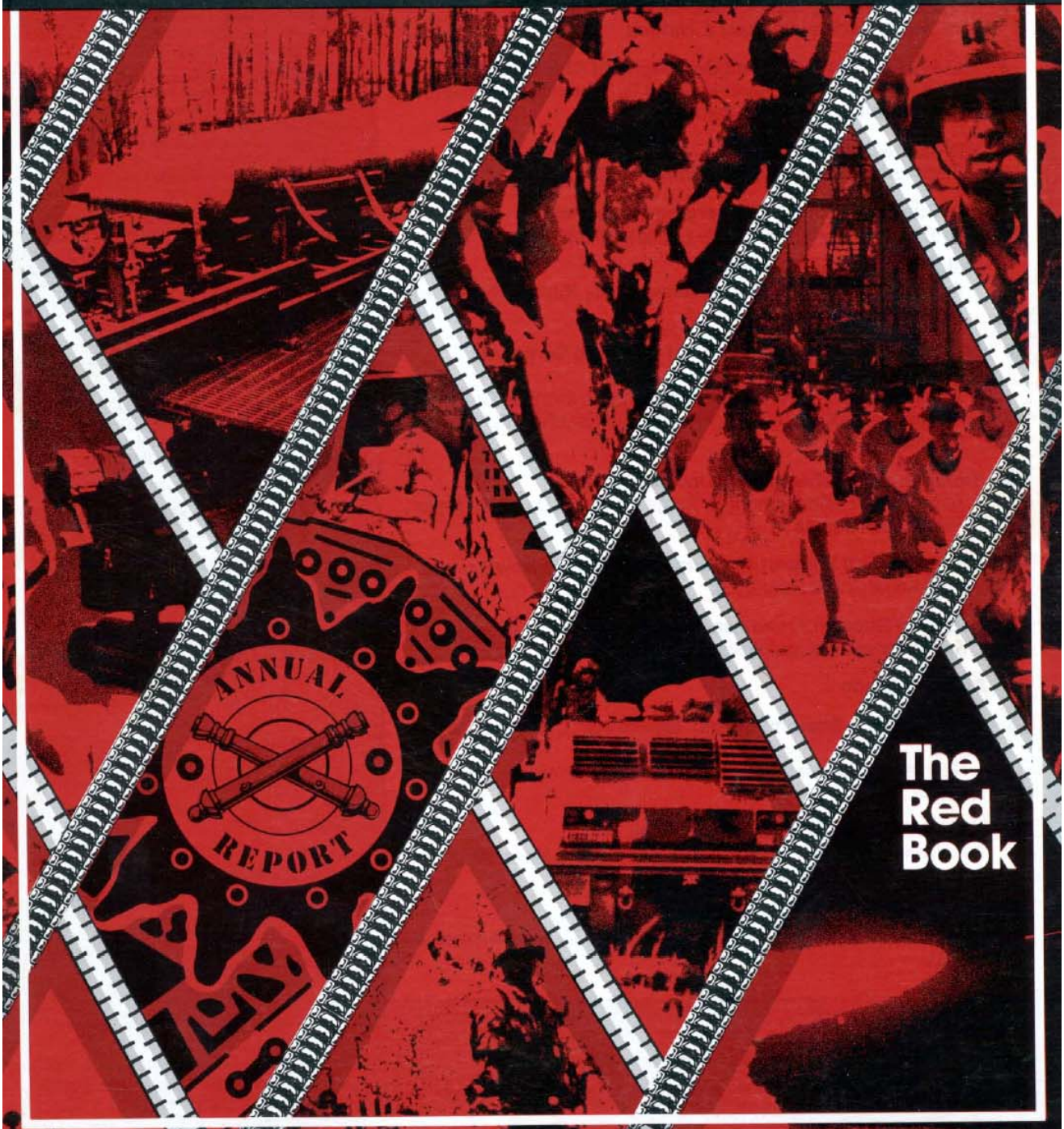
Field Artillery

A Professional Bulletin for Redlegs

December 1988



The Red Book

HQAA PB 6-88-6

A professional Bulletin for Redlegs

December 1988

Field Artillery Hotlines: AUTOVON 639-xxxx or Commercial (405) 351-xxxx
- ARTEP-SQT-AMTP-NTC-JRTC: 2064
- Other Artillery Subjects: 4020

Field Artillery—a bimonthly professional bulletin for Redlegs (ISSN 0899-2525) — is published by Headquarters, Department of the Army under the auspices of the US Army Field Artillery School, Fort Sill, OK. Unless otherwise stated, material does not represent official policy or endorsement by any agency of the US Army. Approved for public release; distribution is unlimited.

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

SUBSCRIPTIONS: May be obtained through the US Field Artillery Association, PO Box 33027, Fort Sill, OK 73503-0027. Telephone numbers are AUTOVON 639-5121/6806 or commercial (405) 355-4677. Dues are $16.00 per year ($31.00 for two years and $46.00 for three years) to US and APO addresses. All other addresses should add $9.00 per subscription year for postage.

SUBMISSIONS: Address all letters and articles to Editor, *Field Artillery,* PO Box 33311, Fort Sill, OK 73503-0311. Telephone numbers are AUTOVON 639-5121/6806 or commercial (405) 351-5121/6806. Material submitted for publication is subject to edit by the *Field Artillery* staff; footnotes and bibliographies may be deleted due to limitation of space.

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

POSTMASTERS: Second-class official mail postage is paid by the Department of the Army, DOD 314, at Lawton, OK 73501. Send address changes to *Field Artillery,* PO Box 33311, Fort Sill, OK 73503-0311.

Headquarters, Department of the Army
By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:
William J. Meehan II
Brigadier General, United States Army
The Adjutant General

RAPHAEL J. HALLADA
Major General, United States Army
Field Artillery School Commandant

Staff

Editor:
Major Charles W. Pope, Jr.

Managing Editor:
Patrecia S. Hollis

Art Director:
Donna Jeanne Covert

Assistant Editor:
Joanne Alexander Brown

Special thanks to Captain John M. Warden and Ms. Beth E. McDonald for their editorial assistance with this issue.

Field Artillery—
King of Battle

Despite Mr. Gorbachev's rhetoric about a more defensive military posture based on the principle of "reasonable sufficiency," there have been no signs that Warsaw Pact forces have changed their doctrine or other manifestations of their offensive orientation.
General John R. Galvin
Supreme Allied Commander,
Europe and Commander-in-Chief, US European Command

The Threat is real, our mission the same and our resolve to accomplish it unwavering. Perhaps now, more than ever, the need to redress the imbalance of conventional forces will receive overdue attention in spite of budgetary constraints that make tough decisions even more difficult. We need to keep our senior civilian and military leaders informed, so they can make decisions that support long-term readiness and not short-term expediency.

During this Year of Training, our Branch has been moving steadily toward the most efficient use of resources to improve readiness and quality of life in an atmosphere of combined-arms cooperation. Major General Raphael J. Hallada, Chief of Field Artillery, highlights some of the major accomplishments in his **State-of-the-Branch Address**. Colonel (P) Josue Robles, Jr., in his article **Innovative Fire Support Training: The Time is Now!** gives us tips to train in units more cost-effectively through innovation and just plain common sense. Lieutenant Colonel William R. Brown adds a resume of the fire support lessons learned at the National Training Center in his article **NTC: Fire Support Trends and Fixes.** One of our combat developments experts, Mr. Dale C. Bailey, clarifies the opportunities available to the Field Artillery in **Fire Support's Future in Emerging Technology.** And Fort Sill's Command Sergeant Major David P. Taylor speaks to our NCOs about developing their careers in his interview with ***Field Artillery,*** **Education: One Key to NCO Development.**

We also are privileged to bring you the thoughts of our Army's master of training and doctrine, General Maxwell R. Thurman. ***Field Artillery's*** interview with the Training and Doctrine Commander and former Vice Chief of Staff of the Army highlights many of the challenges facing Field Artillerymen in a rapidly modernizing Army in **Field Artillery Training and Development Challenges.**

As has become the custom, however, the majority of the Red Book is devoted to *you,* your units, your equipment and information for you to refer to time and again during the year. This edition features **Field Artillery's** first **Centerfold:** a pullout map of our units worldwide. We've also included command sergeants major in this year's commanders list. **Silhouettes of Steel** includes reports by all 38 major units of the total-Army and Marine Field Artillery. Our equipment update focuses on hardware and munitions to be fielded within the next five years. And there's much, much more.

No Army is more dependent on its fire supporters at every level to synchronize combat power to win the combined-arms battle than ours. We hope this Red Book helps you add to the legacy of excellence of the King of Battle. The excellence you see printed here is merely a reflection of your excellence in the field.

Welcome to your Field Artillery 1988 Red Book!

Editor

The Field Artillery State-of-the-Branch Address

by Major General Raphael J. Hallada

We must hold our minds alert and receptive to the application of unglimpsed methods and weapons. The next war will be won in the future, not in the past. We must go on or we will go under.

General Douglas MacArthur

We, in the Field Artillery, stand at a critical juncture in time. Rapid technological advances are being made that will usher in a new era in the tactical art of warfare. Already, the integration of this technology within our Branch has significantly enhanced our war-fighting capabilities. On the horizon, emerging technologies hold the promise of tremendous opportunities for the Field Artillery. With the ratification of the Intermediate-Range Nuclear Forces (INF) Treaty, it's even more imperative that we apply these technologies to maintain the balance of power in Europe.

Our greatest and continuing challenge remains the Soviet Threat. In this decade, no element of Soviet military power has undergone more profound improvement than its conventional forces. For the last five years, the Soviets have systematically spent 17 percent of their nation's gross national product on defense. In many areas, their force is not only quantitatively superior to ours, but also now qualitatively on a par or even superior.

These circumstances only serve to heighten the already critical role of fire support and demand much of the Field Artillery. The challenges of structuring the force, designing and fielding weapons systems and refining doctrine are numerous and complex but far from insurmountable. We must cogently pursue the application and development of both current and near-term technologies. At no other time in history has the future been so full of opportunity for the King of Battle.

We, in the fire support community, readily accept these challenges. For 213 years, the Field Artillery has been the leader of innovation and the decisive arm on the battlefield. We have met and overcome every obstacle and every challenge. Our doctrine is sound and viable, our soldiers are tactically and technically competent and our equipment is modernized and getting better every day.

Force Modernization

This summer, we laid out the Fire Support Master Plan for the remainder of this century and into the beginning of the next. Key to our ability to look optimistically into the future are our gains in the area of combat developments, despite the austere budget and decreasing personnel staffing levels. Faced with the reality of the INF Treaty and the resulting decrease in Field Artillery nuclear fire support, we considered budget, force structure and materiel requirements.

The Master Plan provides the "Azimuth" for us to increase Field Artillery fire support compatibility with modernized maneuver forces on the AirLand Battlefield and looks at the future battlefield from the year 2000 through 2016. In providing increased Field Artillery force compatibility and capabilities, the Plan further meets required mandates to decrease the overall force and stay within budget restrictions. We meet these mandates by designing the future Field Artillery force to replace aging, manpower-intensive weapons systems with state-of-the-art, efficient systems that require less manpower and increase present-day capabilities to levels our maneuver forces demand.

The focal point in designing this plan is a "system of systems" approach that looks at war-fighting capabilities and the various systems we need to best accomplish a particular mission. The system of systems approach groups our war-fighting capabilities into balanced packages that encompass counterfire, deep attack and close support missions, as well as the weapons, munitions, target acquisition, command and control and support and sustainment assets required to support these missions.

While developing these war-fighting packages, we will follow a strategy to

	1955	1965	1975	1985	1995	2005	2015
Range	US	Parity	Soviet	Soviet	Parity	?	
Mobility	US	US	Parity	Parity	Parity	Parity	
Protection	US	US	Parity	Parity	Parity	Parity	
Ammunition	US	US	US	Parity	?	?	
Fire Direction	US	US	US	US	?	?	

US-Soviet Artillery Comparison

enhance deterrence by highlighting new technological efforts that could render obsolete significant components of Soviet war-fighting doctrine, equipment or force structure. Perhaps the best example of this is the Army tactical missile system (Army TACMS) currently undergoing testing.

Simply stated, Army TACMS is an improved munition fired from the existing multiple launch rocket system (MLRS) launcher. The Army TACMS will allow the commander to attack high-payoff targets beyond 100 kilometers. With this extended-range capability, we can attack deeply, disrupt the enemy's momentum, delay his force build-up and attrit his forces to such a point that he can't mass and achieve overwhelming force ratios at the front line. This system will help counter Soviet numerical superiority.

Training

Rigorous, challenging training executed to established standards remains the key to realizing our potential. As a result of the rapidly advancing pace of technology, battlefields of the future will be characterized by high-intensity operations; extended fields of operation; continuous, all-weather and all-terrain operations; and a greater reliance on conventional capabilities to achieve military objectives.

Survival in such an environment demands that we orient our training toward actual combat. Within the past year, we have made tremendous strides in improving the realism of our training. We're preparing to field the artillery complement to the multiple integrated laser engagement system (MILES), called the combined-arms training integrated evaluation system (CATIES). The CATIES will simulate the effects of indirect fire in force-on-force exercises realistically. For the first time in history, the devastating destructiveness of Field Artillery soon will be portrayed accurately at the National Training Center (NTC) during combined-arms operations.

To save shipping costs, we've positioned nine M109 howitzers and placed a division artillery tactical fire direction system (TACFIRE) set with an AN/TSM 141 maintenance van at the NTC permanently. Now, rotating units can train with a mobile division artillery as they'll fight in the next war. The rotating unit will provide the manpower to run the division artillery set and the maintenance van and also to be the TACFIRE maintenance contact team. This will provide an excellent opportunity for the rotating division artillery to enhance its automated fire support system training at the NTC.

Because of feedback from the field, we incorporated a solid foundation of manual gunnery into the program of instruction for 13E advanced individual training (AIT) students. A lack of knowledge about manual gunnery too often has caused units to be unable to mass fires or use backup fire direction center (FDC) procedures effectively. Given this manual gunnery foundation, units will be better able to troubleshoot fire direction problems quickly as they occur and then resume putting "steel on the target."

Force Structure

The Field Artillery force structure is currently undergoing enormous changes. These changes will affect not only the appearance of the artillery in the field, but also the way artillery does business in the future. We have two major actions in Field Artillery force structure that are "driving the train": the 3x8 and the echelons above division (EAD) transitions.

3x8

The 3x8 transition plan increases firepower, survivability and man-to-equipment ratios by converting the artillery from six to eight gun batteries. This entails not only adding to each battery two howitzers, another battery computer system (BCS) and an M577 command post track, but also allows us to split the battery into two, four-gun platoons, improving responsiveness and survivability. The 3x8 transition affects almost all 155-mm and 8-inch howitzer units.

EAD

The EAD transition plan essentially doubles the number of MLRS launchers throughout the force without increasing personnel. The MLRS battalions being fielded are a tremendous force multiplier for the commander. We'll use the manpower resources created by phasing out the 8-inch howitzer to build more MLRS battalions for the corps. For each 8-inch battalion inactivated, we'll have enough personnel to create one and one-half MLRS battalions, increasing our conventional effectiveness by 40 percent. We'll create additional MLRS battalions with personnel from inactivating Pershing units, further enhancing our conventional forces as our reliance on nuclear deterrence capabilities decreases.

Force structure actions have now and will continue to have far-reaching effects on the field. Current budget cuts have emphasized the impact that cost-effective force structuring will have. We're accomplishing both the 3x8 and the EAD transitions, each roughly one-third completed, without significantly increasing manpower in the Field Artillery.

Conclusion

This year has been one of tremendous change and progress for the King of Battle. We have made truly impressive strides in modernizing and restructuring our force, but much remains to be done. We realize yet again that the time-honored values and the unfaltering pursuit of excellence that have motivated and characteriezed Redleg soldiers for more than two centuries are as important today as ever. We have begun our journey along the glide path to the future. Remember—**The Future Belongs to the Field Artillery!**

Major General Raphael J. Hallada is Chief of Field Artillery and Commander of the US Army Field Artillery Center. He has spent more than 13 years in troop assignments with three different Army divisions. He has served in both light and heavy artillery, has had assignments In Europe and CONUS and has had two tours in Vietnam. In the 82d Airborne Division, Fort Bragg, North Carolina, he served as a battalion executive officer, commanded the 2d Battalion, 321st Field Artillery, and was the Division Artillery Commander. In addition, he served as the 82d Airborne Division Chief of Staff, Assistant Division Commander and, for a short period, was the Commanding General. Other Important assignments include serving on the Army Staff In the Office of the Deputy Chief of Staff for Operations and Plans, Washington, D.C., and serving as Director of the Command, Control, Communications and Intelligence Directorate of the United States Army Combined Arms Combat Developments Activity at Fort Leavenworth, Kansas.

General Maxwell R. Thurman, Commander of the Training and Doctrine Command

Field Artillery Training and Development Challenges

What do you consider the most significant challenges that TRADOC [Training and Doctrine Command] faces today?

I have to put my response in the context of what TRADOC's missions are. Our first mission is to establish doctrine. From that flows designing the force—new or changed units to accommodate our third mission, which is determining equipment requirements. Then follows developing leaders, which includes noncommissioned officer [NCO], officer and civilian leadership training. And our final mission is training, period. For everybody.

We have a series of challenges in every one of those missions. So, to single out the highest priority is very difficult. I'd say the one that requires the most care and innovation is leader development. That's because, irrespective of what equipment, doctrine or force design we have, our leaders are the part of the equation that makes the system work.

Field Artillery is doing some "dynamite" work in leadership training with what I call "shared training." The OSUT [one station unit training] soldiers [from the Field Artillery Training Center] go on the BNCOC [Basic NCO Course] three-day field training exercise. During the exercise, the OSUT trainees in their 13th week of training are cannoneers while BNCOC students are gunners, assistant gunners or section chiefs. The ANCOC [Advanced NCO Course] students are the gunnery sergeants or chiefs of the firing batteries. That integration of training enhances the ANCOC and BNCOC students' hands-on leadership skills inside the institution—before they get to the field. Fort Sill's NCO Academy has run four iterations of that revolutionary exercise. And the OSUT troops are getting a lot out of that training.

Field Artillery is doing some "dynamite" work in leadership "shared training."

In officer leadership development, TRADOC is reviewing the complete curriculum of courses at Fort Leavenworth [Kansas]. We're having to absorb the joint military educational system that's a derivative of the Nichols-Goldwater Bill.

From the doctrinal standpoint, we have to incorporate joint and collateral operations such as deep attack, joint suppression of enemy air defense [JSEAD], joint electronic warfare countermeasures and the like. We have to write, codify, field and work that body of joint doctrine for the division and corps levels.

For example, within a year or so, the Army TACMS [Army tactical missile system] will arrive, and we have to define in "nitty-gritty" detail the hookups between the intelligence processors and the fire supporters who "pull the lanyard." That's a major doctrinal effort to allow us to operate in the field when the weapon arrives.

From the equipment requirements standpoint, we have to review *continually* the relationship between the Threat that will exist 10 to 12 years from now and the technologies that'll be available. The confluence of this Threat-to-technology analysis leads to developing new weapons systems. In the case of the tank, it may be an improved gun. In the case of an antitank missile, it may be a hyper-velocity missile. For the artillery, it could be a liquid propellant, a radical shift from the solid propellant base.

In force design, absorbing the Army TACMS or mobile subscriber equipment [MSE], the latter's being tested in the 1st Cavalry Division, will permeate everything Field Artillery does. Designing the force to go with our new equipment is high on the agenda.

Complicating force design are the changes brought about by the INF Treaty [Intermediate-Range Nuclear Forces]. It curtails our PII [Pershing II] forces on the one hand and, perhaps, increases the MLRS [multiple launch rocket system] forces on the other to replace the PII.

The INF Treaty further complicates force design by what I call its "afterglow." Some people now have a "warm" feeling that the Soviets are no longer interested in prosecuting war—that they want to go on the defensive. That's absolute poppycock! We don't see any sign of that change in their strategy. That afterglow could affect our conventional arms talks and result in asymmetrical force reductions.

Finally in training at large, I'm telling the commandants of the branch schools their obligation is to challenge the bright, young soldiers we have in the Army and make the training increasingly demanding. We have high-quality troops who need challenges to stay in the Army.

When you ask what are the most significant challenges in TRADOC, I have to say I have a bunch of challenges on my agenda. Being the TRADOC Commander is like blowing up 100 balloons on 1 October and then rushing around the entire year, making sure no balloon hits the floor.

Would you explain the Nichols-Goldwater Bill and the impact it'll have on our officers?

The Bill will change some career patterns in our officer corps. It establishes the joint professional military educational program, which leads to the joint service officer designation. That program says that before you can get promoted to brigadier general—as if everybody's going to get promoted, which is certainly not the case—you have to have *at least* a two-year tour in a joint-staff billet as a field-grade officer. I didn't do that when I was field grade, though I did later.

That's a minimum of two more years crammed into an already rather arduous program of going to a staff college...being a brigade fire support officer, battalion S3 or executive officer...rising to a battalion command...going to the Army War College...then pulling duty on DA [Department of the Army] staff, at the branch school, in an ROTC [Reserve Officer Training Corps] or recruiting command, with the Guard or Reserve at Headquarters TRADOC or as a combat developer. You must cram all of those into an 11-year period from the time you become a major to year 22, which is when you *might* get promoted to brigadier general, if you're a "hot shot." Two more years of joint duty in that schedule is two years you won't serve inside the Army.

One of the solutions we're looking at is advancing the time you go to Fort Leavenworth [staff college]. Instead of going as a major, you might go as a captain promotable or a senior captain, so we can open up that window to cram in the other two years the law requires.

Nobody in the Army hierarchy is speaking against joint service because that's clearly where we're headed. But the definition of what's "joint" is too strict. I spent seven years in the airborne. To be in the airborne, you have to work with and know a great deal about the Air Force because it's very difficult to jump out of a C130 or C141 aircraft without coordinating with the Air Force. But that doesn't qualify in the lexicon of joint staff duty.

Will we be able to change the definition of what qualifies in the law for joint staff duty?

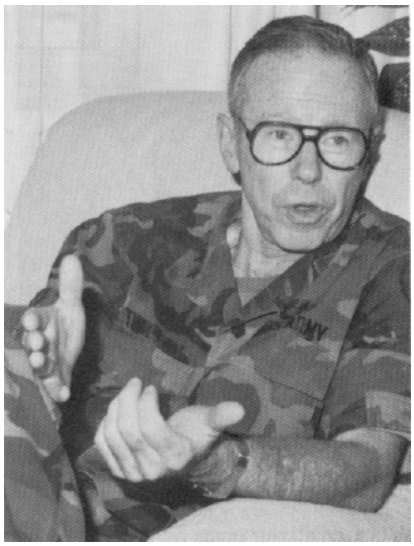
Without hesitation, the Army will obey the law. Having said that, do I think the law should be changed in some respects? The answer is yes. Will it be changed? I think so. On what time schedule? I don't know.

I've appeared before the [Congressional] Skelton Commission, which is looking at joint professional military education. All the Joint Chiefs of Staff and some retired senior officials have appeared before it. Congress is sympathetic to the management problems associated with the requirement for joint staff duty, and I think it'll relax some.

How do you see the AirLand Battle doctrine's changing to meet the challenges of the complex battlefield and the masses of Threat high-quality equipment?

In the next 10 to 15 years, I don't see revolutionary changes. I see evolutionary changes made necessary to properly use the war-fighting equipment that may be at hand. The technologies available will give us some new weaponing opportunities that will modify doctrine slightly. Will we still have tanks on the battlefield in the year 2000? Clearly, yes. Will electromagnetic guns be available to the force in the year 2000? I don't think so. Electromagnetic guns will shoot a slug propelled by electrical current. And they might be such a change that we'd have to alter our tactics and doctrine significantly. Liquid propellants for Field Artillery and tank guns are more reasonably at hand than electromagnetic guns. In other words, we're

The INF Treaty complicates force design by what I call its "afterglow."



Jill Ponto

pressing hard on research and development, but in the near future, it won't change our doctrine much.

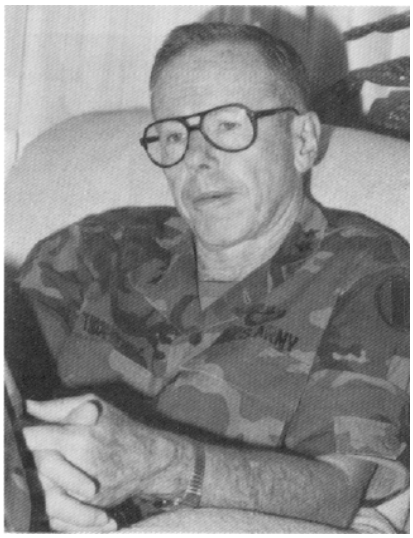
We've had an AirLand Battle Futures study group at Fort Leavenworth for more than a year looking ahead to the year 2000. The group knows, say, we can expect to have a kinetic energy missile in the inventory by the year 2000. It won't change doctrine. But the group is analyzing alternative force structure and designs and modifications to tactics.

Looking downrange about 25 years, I can postulate that space-based radar and directed-energy weaponry, both laser and electromagnetic impulse, are weapons that very well could change our doctrine. We use an orderly process of running alternative concepts through analytic filters to see what the nature of change might be. That's not done easily.

How do we train and support our soldiers to meet worldwide contingencies while facing severe budget and force structure constraints?

Last year we took about a $250 million "knock" in TRADOC. That brought us back to the 1983 funding level. We all gnashed our teeth and wrung our hands because 1983 was the year we didn't train anybody—right?

We have high-quality troops who need challenges to stay in the Army.

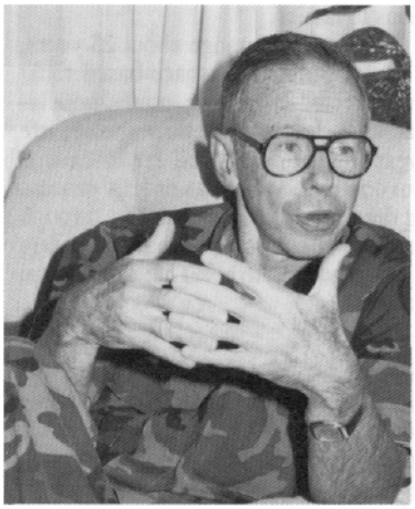


Jill Ponto

We closed all our posts because nobody was there—right? Wrong. The point is, everything is relative.

We've had eight good years of very high procurement budgets. Those budgets have allowed us to bring a vast array of new armaments into the Army. We now have a substantial number of high-quality soldiers who have made many of the Army's personnel problems go away.

Do I think we'll have less resources ahead than we've had in the immediate past? Yes. Can we have high-quality training with less resources? The answer is also, yes. We've matured in the use of training simulations to the point they'll help absorb the shock of some belt-tightening.



Jill Ponto

...the Soviet Artillery is the most foreboding of the current panoply of threats we face...

Now and then, belt-tightening's good. Field Marshal Viscount Slim in his book ***Defeat Into Victory*** talks about the Burma Campaign. One of the things he did every month was cut his headquarters by 10 percent. Because as soon as he cut it, it grew again. What that says, even in wartime, is that you have to take the scissors out and cut. Otherwise, you get fat, lazy and bloated. For the artillery, I want Fort Sill to be slim and trim like a sleek, fast racehorse. I'm less of a hand-wringer.

Can we meet force structure and budgetary constraints until the systems coming on line are actually out in the field to allow us to do the things we say we're going to do in the year 2000?

That's a tossup. The force structure cut that we took in the Army this year was arbitrary. Mr. [Frank] Carlucci [Secretary of Defense] cut 8,400 soldiers with no undergirding deal—just cut. Any successive Secretary of Defense or President of the United States could come in and say, "Okay, take out two divisions." Or Congress could say, "Cut 'x' more dollars out of your budget." The question is, can we meet worldwide commitments that way? Those are the issues that we have to wrestle with.

Our ability to field new systems depends on the maturity of technology. An automatic loader is here today. On the other hand, if you want a cannon that'll shoot 52 kilometers with a 52-caliber gun, then hanging that on a chassis requires some time. We're working on cutting down that time by using a common chassis for new tanks, the AFAS-C [advanced Field Artillery system-cannon] and other vehicles in the Armored Family of Vehicles project [Fort Eustis, Virginia].

As TRADOC Commander, what message would you send Redlegs worldwide?

My message for Redlegs is in three parts. First, the Soviet artillery is the most forboding of the current panoply of threats we face, based on the conventional force structure asymmetry between us. We'll have to do some extraordinary work to get out of the equipment deficiency jam we're in just to match what the Soviets have already fielded. That's the bad news.

Second, and the good news, is that through the aegis of the former USAREUR [US Army, Europe] commander, General [Glen K.] Otis and the efforts of the Defense Science Board, the Secretary of Defense now recognizes this imbalance as a nagging, festering problem that needs redress through the increased allocation of resources for fire support systems. We know the path ahead, provided we can "wring" the resources out to continue the MLRS and howitzer developments. With the arrival of the Army TACMS, the smart munitions and other systems, Field Artillery will have an exciting future.

The third and most salutary message is that the high-quality soldiers coming into our Army are exemplified in Field Artillery, as well as elsewhere. The quality of these youngsters unburdens the unit commander. He doesn't have to spend as much time on personnel problems; therefore, he can concentrate on providing soldiers meaningful training. The "monkey's" on the officers and senior NCOs' backs to provide that training to excite our bright, energetic and ambitious soldiers. All you have to do is "turn them on"—I'm confident you can do it.

General Maxwell R. Thurman became Commander of the Training and Doctrine Command, with Headquarters at Fort Monroe, Virginia, In June 1987. He served as Vice Chief of Staff of the Army where he chaired the first Joint Requirements Management Board for the Joint Chiefs of Staff and as Deputy Chief of Staff for Personnel, both in Washington, D.C. General Thurman commanded the US Army Recruiting Command, with headquarters at Fort Sheridan, Illinois; the 82d Airborne Division Artillery, Fort Bragg, North Carolina; and the 2d Battalion, 35th Field Artillery, during the Tet Offensive in Vietnam.

I Corps Artillery

I Corps Arty continued the aggressive refinement of our "Train for War" concept. The Headquarters participated in exercises such as Cascade Peak in Washington, Yama Sakura in Japan, and Team Spirit and Ulchi Focus Lens in Korea. The successful completion of FIREX-88 in the Utah desert was the finale of many man days of planning, coordination and commitment.

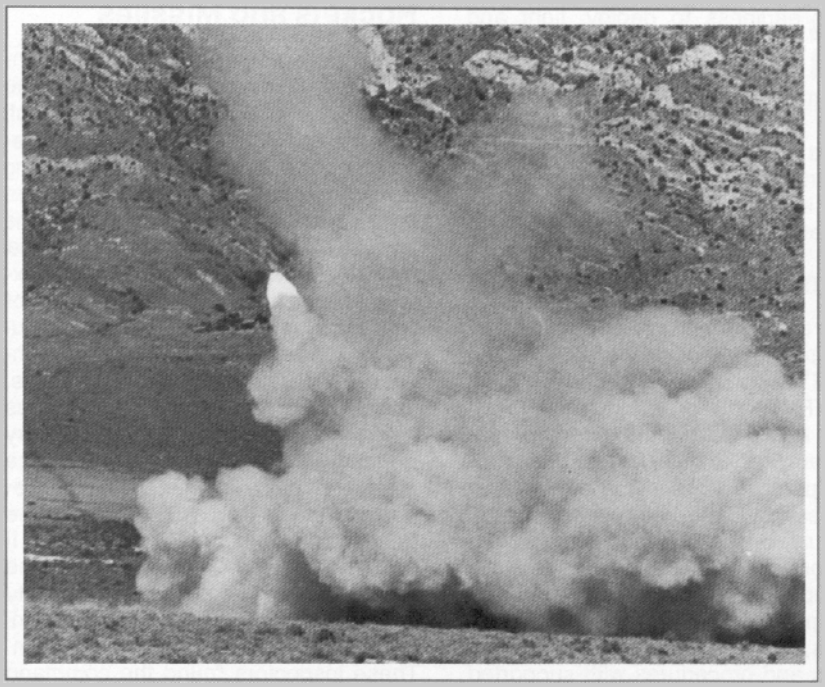
Live-Fire Exercise

FIREX-88 was the largest live-fire training exercise since World War II. The exercise involved more than 14,000 soldiers from Active, USAR, and NG Army units and Active and NG Air Force units. The objectives of the exercise were mobilization, deployment, command and control, synchronization of fire support assets and redeployment. The exercise involved all major commands from the I Corps base—311th Corps Support Command, 142d Signal Brigade, 35th Engineer Brigade, 66th Aviation Brigade, 49 Military Police Brigade and I Corps Arty.

Coordination for the exercise began more than two years ago with planning conferences and preparation of battle books and SOP updates. The training culminated with the I Corps fire support community's conducting a corps offensive action.

The opportunity to synchronize Air Force-delivered live ordnance; attack helicopters, Air Force and Artillery joint air attack team (JAAT) missions; and tube and rocket preparations tested I Corps Arty's ability to coordinate fire support. Many other assets were blended into the exercise such as a remotely piloted vehicle (RPV), Copperhead, target acquisition, Army airspace command and control (A^2C^2), combat service support and rear area and smoke operations.

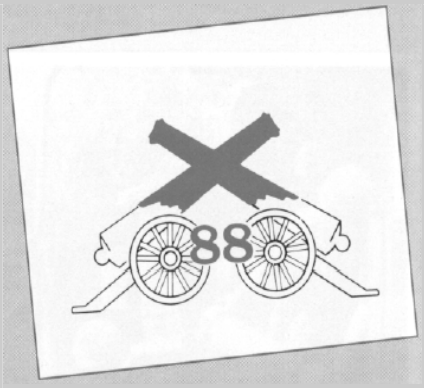
Visitors to the exercise included General Joseph T. Palastra, Jr., Commander-in-Chief of Forces Command; Lieutenant General Herbert R. Temple, Jr., Chief of the National Guard Bureau; 12 foreign attaches; representatives of the Japanese Ground Self-Defense Force and more than 400 other distinguished visitors. The consensus of visitors and participants was it was the "greatest training ever conducted." During the exercise, visitors and participants commented on it: "We finally get to do our real job."..."Have you ever seen 500 pound bombs?"..."JAAT and 12 battalions of artillery fire a corps preparation—Devastating!"



MLRS at FIREX 88, the largest live-fire training exercise since World War II.

FIREX-88 provided the participants an environment to do their jobs—commanders to exercise command and control, the fire support community to synchronize live assets and all the military an opportunity to field test many unproven concepts and assets.

I Corps Arty fielded TACFIRE a year ago and, in FIREX-88, was able to coordinate heavy, light and non-TACFIRE units for 14 days with no down time. During the exercise, the RPV proved its value to the Army.



FIREX 88 Logo

On Time—On Target

I Corps Arty will continue its aggressive involvement in training in the next year. Our participation in overseas deployment training (ODT) exercises, corps-level CPXs and FTXs, and FA brigade exercises continues to send the message that I Corps Arty is prepared for our wartime mission. ***On Time—On Target.***

Silhouettes of Steel

III Corps Artillery

Readiness to deploy, fight and sustain continues as the III Corps Arty's primary focus. Active and Reserve Component cannon, rocket and missile battalions have improved their abilities to provide fire support for the only corps-sized heavy force in the Army with an offensive orientation.

Cannon NTC Rotations

Our cannon battalions are now major participants in National Training Center (NTC) rotations. Whenever a III CORTRAIN division goes to the NTC, III Corps Arty is part of the standard support package. Our six cannon battalions participated in 10 rotations with at least an operations and intelligence section. An equal number of rotations are scheduled for next year. While preparing with the supported divisional artilleries and participating in the three-week NTC rotations, we exchanged training techniques and procedures with supported units throughout the continental US.

Rockets and Missiles

The Corps' deep-attack assets maintained this same war-fighting focus. The Corps Arty MLRS battalion deployed off post for an FTX, which involved massing the battalion's fires from nine firing points. Lance also demonstrated its commitment to integrated operations and training by combining an annual service practice with a standardized external evaluation. It followed that major challenge by completing a Defense Nuclear Agency technical validation inspection in the field with no deficiencies.

Training also has remained the focus of the 3d Battalion, 9th Field Artillery Brigade (Pershing) this year. Before the implementation of the Intermediate-Range Nuclear Forces (INF) Treaty, the Battalion fired one of the last Pershing II missiles at Cape Canaveral. After the Treaty went into force, the Corps Arty has had an initial inspection by the verification team from the Soviet Union. These inspectors found the command and the Pershing Battalion fully prepared for the INF Treaty verification process.

In March, B Btry, 3-9 FA, launched one of the last Pershing II missiles to be fired.

Cannoneers from 4-4 FA (redesignated 5-18 FA) transload ammunition during tactical operations at Fort Sill.

School and Center

The collocation of III Corps Arty with the Field Artillery School and Center makes III Corps Arty unique. During 1988, our units have continued to provide the TOE artillery perspective on new concepts and equipment. These efforts have ranged from testing force development of the HIP howitzer to giving an FA perspective on the single-channel, ground and airborne radio system (SINCGARS) and evaluating Battleking suggestions submitted by artillerymen throughout the Army. The support we provided to the Field Artillery Board and School allowed our soldiers to learn about new tactics, techniques and equipment. We then shared the information with artillerymen around the world.

Combat Multiplier

The next year promises to be an equally challenging and fruitful year for III Corps Arty. We'll continue refining and sustaining the skills needed to provide mobile armored forces with their greatest combat multiplier—fire support.

V Corps Artillery

The Year of Training has been a great one for the 10 battalions of V Corps Arty. In 1988, V Corps Arty up-gunned four cannon battalions to 3x8, redesignated the regiments of three units and integrated a certified MLRS battalion into the Corps.

In training, V Corps Arty focused on war-fighting and orchestrating all fire support assets of the automated battlefield. Efforts included having a Corps TACFIRE CPX and establishing a Corps TACFIRE Board to help standardize TACFIRE SOPs. Corps and echelons-above-corps (EAC) exercises provided excellent training for the continued maturation of the Corps' unique dispersed TOC operation. The Corps Fire Support Module took advantage of the exercises to continue refining counterfire plans and command and control operations.

The integration of Reserve Component assets is vitally important to V Corps Arty war plans. Exercise Corsair Exchange 88 strengthened command and control relationships with the 103d, 197th and 209th FA Brigades.

In the joint-operations arena, V Corps Arty participated in a Directorate of Air-Land Forces Applications (DALFA) study. The study developed the concept of using air power in the counterfire battle. The concept has been briefed to Army, Air Force and NATO leaders and is pending final approval.

The 41st FA Brigade

The 41st FA Brigade, with its Headquarters at Babenhausen Kaserne, has two 203-mm howitzer battalions, one Lance battalion, one MLRS battalion and one 155-mm howitzer battalion. The Railgunners had a highly productive year. They developed and executed a cannon battalion ARTEP scenario with a maneuver phase through the German countryside, followed by a live-fire phase at Grafenwoehr. The Brigade also successfully integrated the split-platoon tactics of 3x8. The results—better trained, more survivable, combat-ready units.

At brigade level, the ***Railgunners*** focused on improving their counterfire relationship with the 8th Infantry Div Arty. Participation in division, corps and EAC exercises as well as combined Brigade-Div Arty Grafenwoehr exercises sharpened their artillery and fire support skills.

Btry C, 4-7 FA, occupies a position at Grafenwoehr.

The 42d FA Brigade

The 42d FA Brigade, with its Headquarters at Depot Kaserne, Giessen, has three 203-mm howitzer battalions and two Lance battalions. The Year of Training offered the ***Wheelhorse*** Brigade several opportunities to strengthen its counterfire role, implement the war-fighting tactics of 3x8 cannon battalions and improve Lance survivability.

Through joint planning, practicing and refining counterfire plans, the Brigade succeeded in reinforcing its relationship with the 3d Armored Div Arty. This teamwork resulted in a live-fire exercise of the counterfire plan during a combined Brigade-Div Arty Grafenwoehr exercise.

The Brigade also successfully implemented the split-platoon tactics of 3x8 before expansion. This proved doubly beneficial, as units became more survivable and accepted force modernization without degrading fire support capabilities.

The Wheelhorse Brigade Lance units hosted a series of USAREUR Operational Survivability Assessment Program tests. The battalions incorporated lessons learned into their tactical operations to increase system survivability.

The 5-3 FA fires at Grafenwoehr.

The 2-23 FA fires a Lance missile during ASP 87.

The Challenge Continues

V Corps Artillery is proud of the innovations and hard, realistic training underway in its two Active and three Reserve Component brigades. The Year of Training has been a good one. The challenge continues in 1989.

Silhouettes of Steel

VII Corps Artillery

VII Corps Arty is the largest corps artillery in the free world—204 cannon, an MLRS battalion and three Lance battalions. Our 8-inch howitzer battalions are 3x8, and our two 155-mm battalions will up-gun in FY 89, bringing our tube strength to 216. With this growth in combat power, we'll continue to focus on war-fighting issues, force modernization, 3x8 tactics, standardization and realistic training.

VII Corps Arty's tube strength will increase to 216 in FY 89.

War-Fighting

VII Corps war councils, general defense plan (GDP) seminars and exercises such as Joint Warrior, Crested Eagle and Able Archer sharpened our command and control war-fighting skills. Equally important were the semiannual battalion operational readiness tests (ORTs) to evaluate "go-to-war" tasks at the firing units. Through these and standard external evaluations (SEEs), the 17th, 72d and 210th FA Brigades evaluated the Corps Arty's battalions, starting from alert to fighting and surviving the counterfire battle. For added realism, we used maneuver rights areas extensively to support these evaluations and tested the battalions' logistical procedures. Brigades fine-tuned their skills through quarterly counterfire exercises and annual combined-arms training at Hohenfels Training Area.

Force Mod, 3x8 Tactics and Standardization

Force modernization has changed the way VII Corps Arty operates. The MLRS and cannon platoons have become the muscle of the Corps Arty, placing greater responsibilities on our platoon leaders and battery commanders. Leadership training and 3x8 tactics seminars at all levels have built a flexible command and control system and enhanced survivability.

Our 8-inch howitzer battalion commanders have trained and evaluated their units using newly developed procedures. The year culminated in a seminar to advance VII Corps Arty toward standardized command and control, logistical and survivability operations for both our Active and Reserve Component brigades.

The VII Corps Arty focuses on realistic, survivable combat training to fight and win.

Realistic Training

Training our mission-essential task list down to section level and continually evaluating the training has been our focus. We have realistic ARTEPs, including combat service support, in a five-day, high-speed scenario. Our version of Iron Primer, a 1st Armored Division exercise to evaluate ammunition resupply and accountability, tested our Class V resupply procedures, while replacements were rushed to the battalion rear. Evacuated casualties and recovered equipment losses were used to regenerate howitzer sections that were rushed back into the "battle" to maintain combat power. As counterfire losses took their toll, battalion and battery commanders decided how to reorganize and refit platoons to maintain command and control and fire control and to maximize fire power (conventional and nuclear).

Moving Ahead

With equipment, procedure and tactics changes, VII Corps Arty focuses on realistic combat training at all levels—moving ahead with the Army.

XVIII Airborne Corps Artillery
18th Field Artillery Brigade

The XVIII Airborne Corps Arty is ready to respond immediately to worldwide contingencies in South and Central Commands' areas of responsibility.

The XVIII Airborne Corps Arty plans, coordinates and directs the fires of all artillery assigned to the XVIII Airborne Corps and synchronizes the joint attack of targets by all fire support means. The Corps' unique responsibilities as the Army's contingency corps is reflected in our training. Ready to respond immediately to worldwide contingencies from South and Central Commands' areas of responsibility, units of the XVIII Airborne Corps Arty are always on the move.

Combined-Arms Support

When subordinate units of the Corps train, the Corps Arty is actively involved. Teams from our Fire Support Element and the Tactical Operation and Intelligence Center deployed to Fort Stewart, Georgia, to support the 24th Infantry Division (Mechanized); to Fort Drum, New York, to support the 10th Mountain Division (Light Infantry); to Honduras on Exercise Golden Pheasant and supported the 227th FA Brigade (Florida ARNG) during its annual training. The 18th FA Brigade (Airborne) is actively involved with its affiliated Reserve Component unit, the 113th FA Brigade (North Carolina ARNG).

Exercises

Computer-driven exercises and war-fighter seminars are important elements of the Corps Arty's battle training for commanders and staff sections. Prominent on training plans are exercises using the battle command training program (BCTP) and the Army training battle simulation system (ARTBASS). In the next year, each battalion of the 18th FA Brigade will receive ARTBASS training using the special FA program. The joint exercise simulation system (JESS) also has been used in BCTP, CPXs, JTX Gallant Knight and XVIII Airborne Corps' Caber Dragon. The Corps Arty is a major player in all the exercises.

Deployability

To be responsive to strategic and regional contingencies and to afford commanders the operational flexibility of fire support at all levels of conflict, the Corps Arty is capable of an airborne forced-entry insertion to put forces on the ground and counter any threat. Headquarters and Headquarters Battery Corps Arty, the 1st FA Detachment (Target Acquisition); Headquarters and Headquarters Battery, 18th FA Brigade, and the 1st Battalion, 39th FA Regiment (1-39 FAR), can conduct airborne operations into the objective area. The 1-39 FAR is the only airborne 155-mm M198 battalion in the Army.

An active airborne training program keeps the Corps Arty ready to deploy worldwide with little notice. We concentrate on mass tactical night airborne operations. In addition, units recently were involved in conducting airborne operations and mass tactical jumps from the C5B aircraft during its recertification. Testing in the near future will certify the C5B for heavy drop of M198s, increasing the mobility of 1-39 FAR and enhancing the rapid strategic deployability of the XVIII Airborne Corps Arty.

During the last year, we added the firepower of the 3d Battalion, 27th FA Regiment (MLRS). In the near future, the M198 battalions of the 18th FA Brigade will convert to 3x8.

Fire of the Dragon

The Corps Arty provides the Corps Commander the ability to attack targets with conventional, chemical and nuclear munitions and fight over the breadth and depth of the battlefield, including attacking deep targets and protecting the rear area. We provide him the agility to act faster than the enemy. The XVIII Airborne Corps Arty, through aggressive training, force modernization and our commitment to do all things well all the time, is the ***Fire of the Dragon.***

Silhouettes of Steel

56th Field Artillery Command

With the implementation of the Intermediate-Range Nuclear Forces (INF) Treaty on 1 June 1988, the 56th FA Command began a three-year program to comply with provisions of the INF Treaty. The Command's mission doubled: it must complete the inactivation process required by the INF Treaty but also must remain combat ready to provide general support nuclear fires to the theater commander. The new and old missions require a training program flexible enough to accomplish both.

Soviet Inspections

The Command's most immediate concern was to develop and implement a program to accommodate Soviet inspectors' conducting baseline, no-notice or close-out inspections of Command facilities. This program required coordination with the host nation, State Department and the newly formed On-Site Inspection Agency (OSIA).

The training process began with the Pershing battalions' developing plans and programs unique to their sites. OSIA conducted several evaluations to determine the success of the Command's inspection training. The "final exam" was given on 5 July when the first Soviet inspection team arrived at the Mutlangen storage area.

Operational Training

The remainder of the 56th FA Command's training program concentrates on two areas: operational and logistical training. Operational training focuses on command and task-force level skills needed to shoot, move and communicate on a mid- to high-intensity battlefield.

At the command level, operational training involves the command, control and support of the three Pershing task forces as they move in their areas of operation and maintain their required target coverage. Since this is accomplished through two tactical command posts and a command support area, the training must be consistent and address the specific needs of a Pershing unit. To ensure an understanding of Pershing's role in AirLand Battle, the Command conducts a series of "How-To-Fight" seminars.

Practical application of this training for the Command's 6,000 soldiers occurs during command-wide field training exercises conducted semiannually over much of southern Germany. The training was evaluated in June with the first command-level tactical evaluation administered by NATO. This Tac Eval checked the Command's ability to survive and provide nuclear fires while continuing to provide logistical support to the Pershing task forces.

The Pershing task force also has operational training as it combines combat and combat service support units to accomplish its mission. The task force commander trains his subordinate leaders to integrate their support slices to provide the logistics, security and survivability necessary to launch his Pershings. He applies this training in task-force FTXs conducted on a regular basis. Task-force Tac Evals follow an 18-month cycle.

Logistical Training

Our logistical training emphasizes individual skills in operator maintenance and property accountability. The INF Treaty requires careful tracking of more than 100 Pershing missiles and Treaty-limited items; the accompanying unit inactivation means the transfer of 1,800 vehicles, numerous lines of TOE property, more than 6,000 sets of individual equipment and the Command's installation property.

Continuing the Tradition

For the next three years, the 56th FA Command will continue its tradition of combat readiness while meeting all the requirements of the INF Treaty. The Command's training program will provide the foundation for our success.

The 56th FA Command concentrates on training to implement the INF Treaty and, at the same time, provide general support nuclear fires for the theater commander.

United States Army Field Artillery School (USAFAS)

In the Year of Training, USAFAS focused its energies to "Train as we Fight." We modified our courses and the academic environment to more accurately replicate "real world" challenges for our artillery leaders—officers and NCOs alike. We are rededicated to providing quality training in all fire support disciplines and developing the doctrine, materiel and organizations to support the maneuver forces well into the 21st century.

Doctrine

Modifying doctrine to maximize fire support for the demands of AirLand Battle is an exciting and ceaseless challenge. In May, *FM 6-20 Fire Support in the AirLand Battle* was printed for Army-wide distribution. We've revised other manuals in the 6-20 series with field input, and they're currently in final draft for publication during 1989: *FM 6-20-30 Fire Support for Corps and Division Operations, FM 6-20-40 Fire Support for Brigade Operations (Heavy), FM 6-20-50 Fire Support for Brigade Operations (Light), TC 6-50 The Field Artillery Cannon Battery* and *TC 6-60 MLRS Operations.*

NTC

To accurately identify and improve fire support inadequacies, the School is working closely with the combat training centers and other agencies to analyze fire support effectiveness in combined-arms operations.

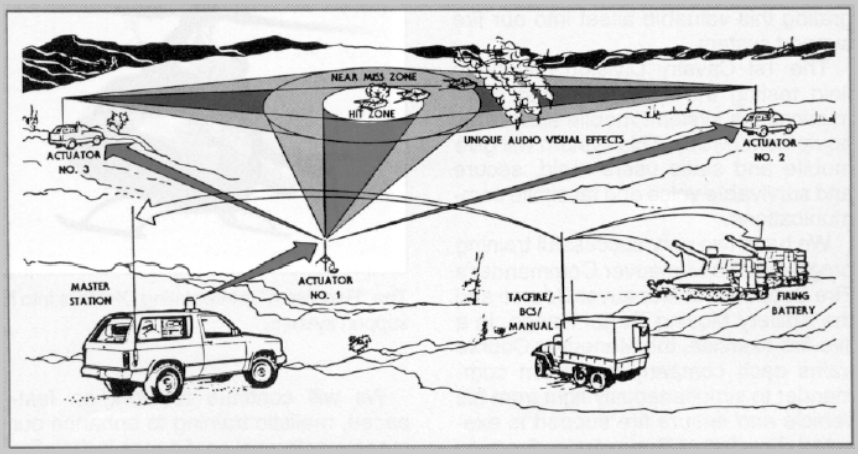
To help units during training rotations at the National Training Center (NTC), USAFAS has requested the Army preposition equipment (howitzers, TACFIRE sets and meteorological equipment) at Fort Irwin, California, for units to use upon arrival. This would reduce redundant transportation expenses and minimize shipping damage to unit equipment.

Additionally, USAFAS is aggressively working to enhance training realism at the NTC by developing the multiple integrated laser engagement system (MILES) for howitzer use and fielding the combined-arms training integrated evaluation system (CATIES) to simulate and assess fire support effects in "battle."

Master Plan

We created the Fire Support Master Plan—The Azimuth—to layout the 30-year strategy for modernizing fire support systems and force structure.

To enhance our conventional war-fighting capabilities, the Plan identifies short- and long-term initiatives for a balanced acquisition and development strategy. These initiatives will significantly improve our force effectiveness within funding and force-structure limitations. We'll review the Plan annually to incorporate technological breakthroughs and adjust the focus, based on budget decisions.



CATIES will realistically simulate and assess the effects of indirect fire in “battle” at the NTC.

Officers' Courses

We've restructured the Officer Basic Course to ensure each graduate arrives in his field unit with a Warrior Spirit, having technical and tactical competence and a strong foundation in fire support and leadership skills.

Beginning with Class 2-89 in February, the School will implement small group instruction (SGI) in the Officer Advanced Course. The SGI will use small group development and learning techniques and will make the student responsible for his own learning. It also will provide students the continuous mentorship of an accomplished fire support leader. We're determined to train leaders to be thinkers—decision makers.

Field Feedback

One of our best sources of information is You, the members of the fire support community. We encourage you to give us your ideas and feedback. You're where the doctrine, materiel and training are put to the test. The Field Artillery School is here to support you!

Silhouettes of Steel

1st Armored Division Artillery

Battery A, 94th FA (MLRS), in Action!

The 6-1 FA in MOUT Operations

The 1st Armored Division "Old Ironsides" Artillery continues its quest for excellence in fire support as a part of the Army's most forwardly deployed Division on the European frontier of freedom. Our tubes are laid on three training objectives:

- Improve agility through streamlined command and control.
- Maneuver fires rapidly onto high-priority targets.
- Concentrate training on predictive-fire gunnery fundamentals.

The Div Arty achieved its training objectives during the year through various field exercises. In our live-fire Artillery Gunnery Exercises at Grafenwoehr Training Area, we used lasers and computers to tell units how accurate their rounds were on each fire mission. In the Div Arty's Interdiction and Counterfire Exercise at Grafenwoehr, we executed live counterfires and perfected skills to mass multiple-battalion fire on interdiction targets. The Division's force-on-force, NTC-style exercise Ironstar at Hohenfels Training Area evaluated our ability to support maneuver forces on a high-stress battlefield.

Old Ironsides Artillery completed several major projects in the last year. In January, we redesignated three of the Div Arty's units: 1-22 FA became 2-1 FA; 2-78 FA became 3-1 FA; and 6-14 FA became 6-1 FA. The highlight of the ceremony was the simultaneous redesignation via a satellite hook-up of our battalions and those of our sister units in the 1st FA Regiment, 5th Mechanized Div Arty at Fort Polk, Louisiana.

Our B Battery (TA), 25th FA, increased the mobility and survivability of Firefinder radars—the "Agile Fire-finder." We can emplace and displace Firefinders in less than half the time required in the original configuration.

The ***Iron Gunners*** remain battle focused and confident we can meet the enemy's challenge.

1st Cavalry Division Artillery

The 1st Cavalry Division trains for a potential European battlefield, focusing on the "maneuver" of massed fires in synchronization with other combat systems. This year, the Red Team honed "hipshoot" and direct-fire skills that sustain attack momentum and increase the survivability of cannon and crews.

On REFORGER 87, more than 1,200 Red Team soldiers deployed to Europe. During REFORGER, we extended command and control and exercised fire support and logistics at doctrinal distances. The 3d Battalion, 82d FA; A Battery, 21st FA (MLRS); A Battery, 333d FA (TA); and HHB all trained the way they'll fight.

At the National Training Center (NTC), the 1st Battalion, 82d FA, headed our list in support of the 1st "Iron Horse" Brigade. The Div Arty TOC, augmented with a support slice, also deployed. We provided the support to allow the direct support (DS) battalion to focus on its mission.

In force modernization, both our direct-support battalions completed 3x8 transitions and fielded the fire support vehicle (FSV). The Division currently is receiving OH58D helicopters and integrating this valuable asset into our fire support system.

The 1st Cavalry Division has been field testing the Army's newest communications system: mobile subscriber equipment (MSE). This system will give mobile and static users rapid, secure and survivable voice and facsimile communications.

We have two very successful training programs: the Maneuver Commander's Fire Support and Maneuver Course and the Artillery Moving Target Range. In a live-fire exercise, the Maneuver Course trains each company and team commander to simultaneously fight from his vehicle *and* ensure fire support is executed. The Target Range trains fire supporters to engage moving targets.

The "Red Team" is integrating OH58Ds into its fire support system.

We will continue to work on fast-paced, realistic training to enhance our maneuver forces' confidence in their fire support. ***First Team, Red Team!***

1st Infantry Division (Mechanized) Artillery

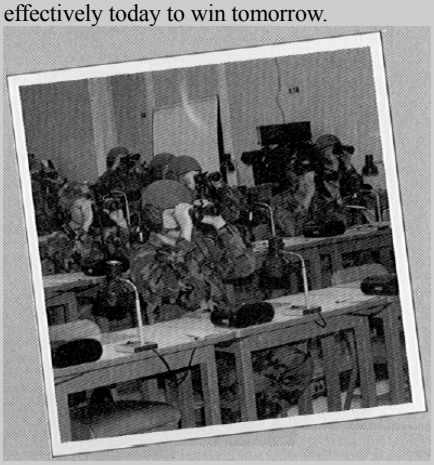
The 1st Infantry Div Arty is training soldiers today to win in battle tomorrow.

Well-coordinated fire support is vital to success on the AirLand Battlefield. For this reason, the Div Arty focuses its efforts on developing better ways to integrate fire support and maneuver. We devised new techniques—using available resources and existing battle simulations—to train Redlegs and the maneuver commanders they support.

Not satisfied with the status quo, Redlegs of our Div Arty looked for better fire support training ideas. Our recently published Fire Support Training Guide outlines some ideas we found helpful and provides guidelines for fire support training. The Guide is an outgrowth of the Division's Fire Support Improvement Plan (FSIP) developed to correct fire support deficiencies observed during National Training Center (NTC) rotations.

The Fire Support Training Guide helps improve fire support operations. It offers solutions to resource problems—how you can best use available personnel and equipment. The Guide also suggests home-station training that requires few resources but provides outstanding simulated combat situations. The Guide outlines what you can do to change your training set fire observation (TSFO) into a combined-arms fire support simulator. It shows how to establish a 1:10 scale fire coordination exercise (FCX) training lane. It also shows how to set up moving target and moving forward observer training lanes. (See Page 46 for instructions on how to order the Guide.)

By using innovative techniques such as those described in the Guide and by best using available resources, the 1st Infantry Div Arty of the **Big Red One** is training effectively today to win tomorrow.



The 1st IN Div Arty's "Fire Support Training Guide" tells how to turn a TSFO into a combined-arms fire support simulator.

2d Armored Division Artillery

The 2d Armored Div Arty contributed to the Army's artillery employment and training doctrine during FY 88. In December 1987, the Joint Chiefs of Staff (JCS)-sponsored Operation Grey Steel tested doctrine for transporting chemical rounds. We also supported the Combined Arms in a Nuclear Environment test (CANE IIB). For 42 days, units successfully performed their combat missions in various levels of MOPP.

The Div Arty participated in both III Corps and Forces Command CPXs. Exercise Ready Phantom tested the joint exercise simulation system (JESS). Exercises Golden Saber and Brave Shield linked JESS with units maneuvering in the field. We also supported two National Training Center rotations—a high point was the Army's first deployment of OH58D helicopters.

In training evaluation, the Div Arty developed a situation-based, live-fire exercise to test the artillery team. Marking rounds simulated the enemy maneuver, triggering the correct sequences in FISTs' fire support matrices. The direct-support battalions then executed their fire plans.

Admiral Crowe and Marshall Akhromeyev coming to look at "Hell's Fires."

In July, Admiral William J. Crowe Jr., Chairman of the JCS, gave a fire mission to the 2d Armored Division: a combined-arms, live-fire demonstration for his Soviet counterpart, Marshall Sergei Sedervich Akhromeyev. This exercise included an MLRS and 155-mm preparation of suppression of enemy air defense targets for four F-16 aircraft to release their 12, 2,000 pound bombs; a joint air attack, including AH-64 helicopters and A-10 aircraft supported by a direct-support FA battalion; and an Apache-fired Hellfire missile's neutralizing a target lased by an OH58D. The demonstration concluded with 1-3 FA's firing more than 700, 155-mm rounds to support a maneuver task-force attack.

The OH58D positions itself to guide steel on target.

Hell's Fires is ready to support the most modernized heavy division in the Army.

2d Infantry Division Artillery

The 2d IN Div Arty crossing a river during Team Spirit 88.

The Div Arty occupying a position during Team Spirit 88.

The 2d Infantry Div Arty trains daily to fight in defense of the Republic of Korea (ROK). Our mission is to deploy on two hours' notice, provide devastating fire support for the Division and reinforce the artillery fires of our Korean Allies.

To focus and evaluate our training, the four battalions and Div Arty conduct 16 hours of TACFIRE training each week. We reinforce this training with quarterly fire support CPXs to integrate division, brigade and battalion fire support elements, FISTS, COLTS, radars, TACFIRE shelters and tactical operation centers, as well as OH58D helicopters, using a two-day war plan scenario.

The 2d Infantry Division continues interoperability training with our ROK Allies. Our battalions participate in a minimum of one FTX quarterly with a ROK corps artillery unit and in all Combined Field Army massed-fire exercises. In turn, ROK artillery units supplement the Div Arty fires during our semiannual massed-fire exercises. In all exercises, we employ the Q-36 and Q-37 radars to demonstrate the capabilities of this target acquisition means to the ROK Army.

With Korea's mountains and widely dispersed mobility corridors, our job is unique and demands innovative task organization and missions. Our war plans include forming a strike force centered around each direct support 155-mm battalion. The strike force has the organic COLT teams, two Firefinder radars and one MLRS platoon. This strike force provides responsive "high-tech" munitions to support our ROK Allies.

The 2d Infantry Div Arty has 3,200 soldiers forwardly deployed on "Freedom's Frontier" engaged in rigorous, innovative training to provide awesome fire support to US and ROK maneuver commanders—fit to fight, determined to win!

3d Armored Division Artillery

The winning attitude demonstrated by the soldiers of "Spearhead Steel" during REFORGER 87 was the culmination of extensive training and planning for the Army's most forwardly deployed Division.

During 1988, the Div Arty completed our 3x8 transition and redesignated two battalions. With the Spearhead Division's fast-paced, dynamic training program, the "Steel" battalions practiced with their slice of the integrated battlefield in several CPXs, FTXs and live-fire exercises at Grafenwoehr and Hohenfels Training Areas.

The Year of Training started with our total participation in the corps-level exercise Caravan Guard. As the Div Arty TOC moved nine times in 10 days, we synchronized the use of OH58D helicopter aerial fire support officers and 3x8 platoon operations and completed Div Arty, FA brigade and Armored Cavalry Regiment mutually supporting operations.

“Spearhead Steel” trains in all weather to support the Division assigned to the Fulda Gap.

Weekly TACFIRE, radio teletype and maneuver control system training ensures our unity of effort for the Division Commander. With well-trained communication teams, the Div Arty signal officer improved our ability to survive on the battlefield with innovative techniques for using equipment. The Div Arty continues to provide the Division Commander the flexibility to accomplish his complex General Defense Plan.

Our Steel battalions evaluate sections and platoons in exercises each quarter as the backbone of their readiness training. By emphasizing officer and NCO certification at each level, the total fire support package has met the first and foremost challenge—"Win because we simply won't accept losing."

In 1989, the **Gunners and Dragons of *Spearhead Steel*** will continue our support of the Division assigned to defend the Fulda Gap.

3d Infantry Division Artillery

The 3d Div Arty continues to focus on finding better ways to stretch and train with the TACFIRE system while placing a premium on individual and section training and testing. Last year we tested more than 240 sections at Grafenwoehr Training Area.

We also have continued to develop and refine a very aggressive maneuver rights area (MRA) training program. Each of our three direct-support battalions has undergone an ARTEP during the past year, using both the MRA scenario and a live-fire exercise at Grafenwoehr. We extended our logistical and communications systems to wartime conditions. This ARTEP may be the most demanding yet realistic training exercise the Div Arty has undertaken.

Elements of the Div Arty, to include fire support officers and fire support teams, are always present when any of the Division's maneuver elements train at the company or higher levels. Because of our combined efforts, the relationship between maneuver and fire support remains excellent.

During August of this year, the Div Arty battalions were redesignated the 41st FA Regiment. Both the 5th and 6th Battalions, 41st FA, joined the 2d Battalion, 41st FA, as the Marne's Division Artillery.

The REFORGER 88 was a great exercise for the Div Arty this year. Extensive training in fire support developed a cohesive team that met the challenge. The rigorous training program followed by this fast-paced exercise demonstrated the 3d. Infantry Div Arty can provide the fire support needed for the Marne mission.

The 3d IN Div Arty tubes point toward "the enemy" at Grafenwoehr Training Area, the "NTC" of Europe.

4th Infantry Division (Mechanized) Artillery

Realistic, demanding, task-oriented, wartime, scenario-driven exercises describe the 4th Div Arty's training this year. Our imaginative use of training assets allows us to accomplish our primary mission: provide fire support to the Division with consistent excellence.

The Div Arty's FSE helped the Division's war planners during REFORGER 87 in the Northern Plains of Germany. During our divisional exercise Orbit Halcyon, the Div Arty controlled the fires, positioning and logistical reporting for 17 FA battalions. For the first time, the entire Division's TACFIRE system was "on" and remained operational—even the board players in the "First Battle" simulation center had digital message devices (DMDs). Our units devastated the enemy. In the III Corps exercise Golden Saber, we integrated fires, rapidly displaced and provided lightning-fast responses—artillery raids supported by the maneuver forces.

The 4th IN FIST prepares for realistic, demanding training at the NTC.

The Div Arty's battalions had standardized external evaluations (SEEs) with scenarios developed jointly with their supported brigades and based on wartime situations. The SEE is a fast-paced, five-day warfighting exercise that evaluated battalion actions from the marshalling area through the staging area and during its role as general support artillery for a NATO force. The battalion then assumed its direct support mission, conducted a forward passage of lines with NBC play, supported the main attack (firing batteries moving in wedge formations behind their infantry platoons) and prepared for a counterattack.

Maneuver brigades supported our battalions down to platoon level during the two-day CFX in support of the SEE. The brigade TOC and a task force deployed as controllers to provide input and add "friction" for the players.

Death on Call *is* the business of the 4th Infantry Div Arty.

Silhouettes of Steel

5th Infantry (Mechanized) Division Artillery

Btry C, 21st FA (MLRS), during a live-fire exercise at Fort Polk.

The 4-1 FA participates in an emergency mission during a SEE.

In 1988, the 5th Infantry Div Arty emphasized training realism. The Div Arty used only non-standard firing points in training, and we reconnoitered, selected and occupied positions as we'd have to in battle. We used neither firing points nor markers. Units cleared terrain through maneuver channels and computed safety as in combat. Our quarterly Division CPXs were war-plan, scenario-driven, using "First Battle" modified to incorporate realistic counterfire with voice and digital links among radars, the Div Arty TOC, MLRS battery and simulation center.

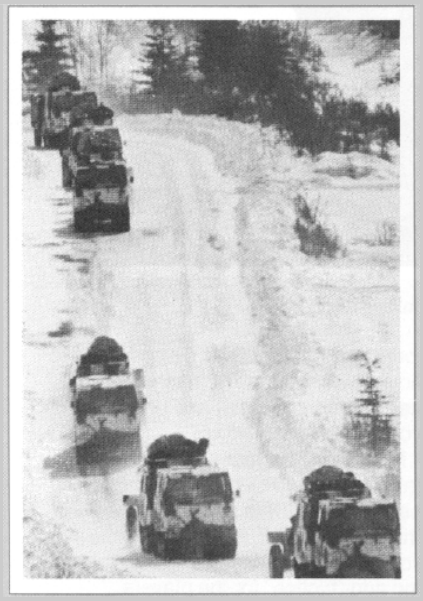
The direct support battalions participated in three National Training Center rotations, and our Round-Out battalion, 1st Battalion, 141st Field Artillery, (Louisiana ARNG) participated in the first rotation by a National Guard FA battalion to the NTC. The Div Arty Headquarters and TOC, a Q36 and Q37 radar section and an MLRS firing platoon also participated in two rotations to control the counterfire battle.

The Div Arty conducted challenging and realistic standardized external evaluations. To increase fire support proficiency, we used the Army training battle simulation system (ARTBASS) at the brigade level for the first time.

Quarterly MLRS live fires enhanced training realism. The Div Arty TOC and FSE participated in III Corps Artillery's CPX Golden Saber. We supported five FA battalions and two FA brigades with mobile training teams during their annual training. An imaginative training set fire observation (TSFO) program improved fire support skills and integrated TACFIRE sustainment training at all levels.

Next year, we'll continue our emphasis on training realism while going through significant force modernization.

6th Infantry Division (Light) Artillery



The new “Artic Thunder” Div Arty trains to conduct combat operations in the northern regions of the world.

The Army's newest division artillery was activated provisionally on 1 August 1988 in a ceremony at Fort Richardson, Alaska. The Div Arty will formally activate 16 January 1989.

The 6th Div Arty consists of the Headquarters and Headquarters Battery and two 105-mm cannon battalions—the 4th and 5th Battalions of the 11th FA, at Forts Richardson and Wainwright, respectively. Rounding out the firepower of the Div Arty is the 3d Battalion, 14th FA, 205th Infantry Brigade (USAR). The Division's 155-mm general support battery also will be part of the reserve component as A Battery, 11th FA, when it's activated.

Even before its formal activation, the Div Arty staff was planning, not only the formation and operations of the Div Arty Headquarters, but also the operations and training of the battalions. Given our mission of maintaining the combat readiness of Field Artillery battalions to defend Alaska and to deploy worldwide, the Div Arty's focus is realistic training executed to exacting standards.

Operations in our northern latitudes pose unique challenges for our soldiers and materiel. To meet these challenges, we'll participate in numerous CPXs and FTXs: battalion ARTEPs (active component), Div Arty readiness tests (DARTs) for firing batteries and the Yama Sakura CPX in Hokaido, Japan.

The climax of the winter's activities will be the joint readiness exercise Brim Frost 89. During this Joint-Chiefs-directed exercise, the Div Arty will deploy throughout Alaska to demonstrate our ability to conduct combat operations in the northern regions of the world—***Artic Thunder.***

7th Infantry Division (Light) Artillery

The 7th Div Arty lives up to its reputation as part of the Army's first and one of the finest light divisions. In the past year, "Bayonet" Artillery units deployed with the Division's maneuver forces to diverse locales: Yakima Firing Center, Washington; Honduras, Panama and the Republic of Korea; the Joint Readiness Training Center (JRTC), Fort Chaffee, Arkansas; the National Training Center (NTC), Fort Irwin, California; White Sands Missile Range, New Mexico; Dugway Proving Grounds, Utah; Fort McCoy, Wisconsin; and Camp Ripley, Minnesota.

The Div Arty's three direct-support battalions (M102), the I Corps Artillery's general support battalion (M198), the organic eight-gun general support battery (M198) and Div Arty Headquarters all provided the Division the best fire support available for the widely varying climate and terrain covering half the world.

The 7th IN TAB prepares to displace a Q36.

The Div Arty proved it's ready to deploy anywhere with little notice during Operation Golden Pheasant in Honduras and during other major training exercises, including Team Spirit 88 in Korea and Gallant Eagle at 29 Palms, California.

Innovative training by units of the Bayonet Artillery included many battery-and battalion-level FTXs, semiannual Bold Thrusts (external battalion evaluations),

The "Bayonet" Artillery trains to deploy anywhere with little notice.

division-level CPXs, including Celtic Cross VI, the American-British-Canadian-Australian (ABCA) combined CPX Caltrop Tyro, I-Corps' FIREX 88, and rotations at the NTC and JRTC.

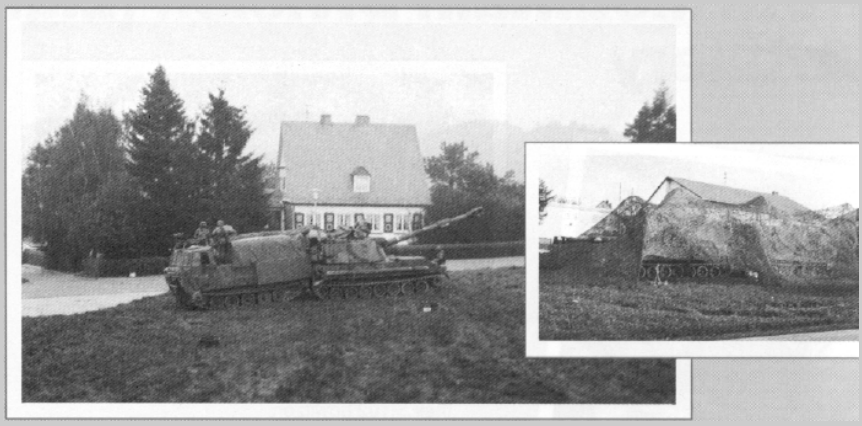
The 7th Div Arty leads the way in developing "light" doctrine and testing light systems for future fielding. The Div Arty is prepared to help the 7th Infantry Division (Light) ***Bayonet*** the Threat anywhere in the world.

8th Infantry Division (Mechanized) Artillery

Fiscal Year 1988 was another exciting, challenging training year for the 8th Infantry Div Arty. We trained extensively in off-post maneuver rights areas (MRAs) and with live-fire exercises at Baumholder and Grafenwoehr major training areas (MTAs) to sharpen our war-fighting skills. Our emphasis on integrating combined-arms training with division-level tactical exercises has enhanced our ability to mass fires quickly across the Division sector.

The Div Arty integrated the total artillery team in training. At Grafenwoehr, we employed Firefinder radars extensively to enhance our counterfire training. We had two combined live-fire exercises with the 41st FA Brigade, which incorporated TACFIRE mutual support operations and culminated in time-on-target (TOT) missions.

While training on all aspects of force artillery command and control and fire support, the Div Arty emphasized counterfire and suppression of enemy air defense



The “Pathfinder” Div Arty trains extensively in off-post MRAs to prepare for its mission in Europe.

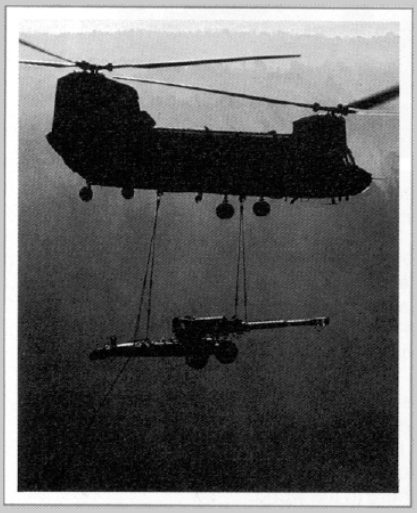
(SEAD) and joint air attack team (JAAT) operations. Additionally, we had the first of our five-day MRA and MTA standardized external evaluations (SEEs) for the cannon battalions. Participating in the SEE to add realism to the tactical scenario were maneuver unit scouts, infantry platoons equipped with the multiple integrated laser engagement system (MILES) and brigade tactical command posts.

The Div Arty also participated in Caravan Guard (a V Corps field exercise) in February. Our battle staffs received valuable, stressful operations and logistics training that bred battlefield success during Certain Challenge (REFORGER 88).

The 8th Div Arty stands ready to provide devastating fire support for the combined-arms team. ***Pathfinder's Power!***

Silhouettes of Steel

9th Infantry Division (Motorized) Artillery



An M198, 155-mm howitzer of the 9th Div Arty is airlifted by a CH47D at Fort Lewis.

The past year was busy for the 9th Div Arty with our emphasis on preparing for war. In January, the Division piloted the Army's new Battle Command Training Program (BCTP), a sort of NTC for division and corps. The BCTP exercised artillery movement and positioning, Div Arty fire control, ammunition, resupply, division-level deep targeting and fire support coordination in real time. It culminated with exercise Warfighter, a five-day simulation-based CPX.

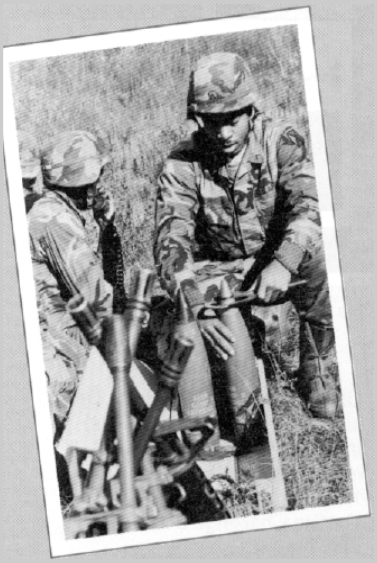
The Division had its first rotation to the National Training Center. Elements of two of our M198 battalions, the Div Arty HHB and E Battery (TA) accompanied the 3d Brigade slice to the NTC. Together we achieved some notable successes, including an aggregate effectiveness rate of more than 70 percent and the first Copperhead kills ever recorded at NTC.

With the NTC behind us, Div Arty Headquarters, E Battery (TA) and C Battery, 1st Battalion, 84th FA (MLRS), deployed to Dugway Proving Grounds, Utah, to participate in I Corps Artillery's FIREX 88. In FIREX, we practiced everything from deployment and live-fire of MLRS across doctrinal frontages, command and control of reinforcing Corps Artillery to simultaneously massing tube and rocket fires.

During our active summer of ROTC and Reserve Component support, we regrettably inactivated the 6th Battalion, 11th Field Artillery, one of our three M198 battalions. It was the slice of the motorized brigades inactivated because of budget cuts. Replacing the Battalion is 2d Battalion, 146th FA (Washington ARNG).

The 9th Div Arty looks forward to another year of training to provide firepower for our Motorized Infantry.

10th Mountain Division (Light Infantry) Artillery



Soldiers of the 10th Div Arty prepare a round for firing.

MSG Robert D. Murphy

Cannoneers from C Btry, 2-7 FA, prepare to fire their M102 howitzer.

The 10th Mtn Div Arty focuses its training on supporting the various contingency missions assigned the Division. In 1988, we activated our final unit in the 10th Div Arty as E Battery, 7th FA, which uncased its guidon on 1 September. Now with our full complement of artillery, we train to support combined-arms operations from battalion task force through division level.

This year, Div Arty units seized every opportunity to train with both battalion and brigade task forces. Deployments by each battery of the 2d Battalion, 7th FA, to Fort Benning, Georgia, in support of the 2d Brigade, 10th Mountain Division, practiced and evaluated all factors of battery and battalion operations from deploying to firing in support of maneuver forces. We also supported the 2d Battalion, 22d Infantry's rotation to the Joint Readiness Training Center, Fort Chaffee, Arkansas, in December 1987. While there, the soldiers of B Battery, 1st Battalion, 7th FA, set the standard for light artillery operations in a low-intensity environment.

These combined-arms exercises have been the framework for a series of joint external evaluations (EXEVALs) of Div Arty units. Under this concept, batteries are evaluated as part of the infantry battalion task force EXEVAL and battalions are evaluated externally as part of an infantry brigade exercise.

In 1989, the 10th Mountain Div Arty will continue to improve its training focus. Our goal is to fire every round so its impact is in sight of the maneuver arms. We lead the way in developing light artillery doctrine as we support the 10th Mountain Division in its ***Climb to Glory.***

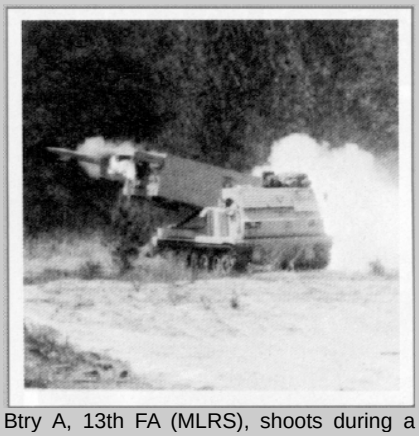
24th Infantry Division (Mechanized) Artillery

The Victory Div Arty refined procedures during two National Training Center (NTC) rotations and several training exercises in 1988.

One of the best was our participation in Fort Leavenworth's Battle Command Training Program (BCTP). This real-time, computer-driven corps and division CPX thoroughly tested every staff area and proved invaluable in refining our war plans. We successfully used amplitude modulation (AM) TACFIRE communications between Fort Stewart, Georgia, and Fort Bragg, North Carolina, during BCTP, proving its vitality over extended distances.

The Div Arty's emphasis has been on realistic combined-arms training. We incorporated maneuver players into Div Arty CPXs and FTXs. We also used NTC after-action review (AAR) tapes in our Battle Simulation Center to train FSOs to develop and brief a fire support plan under realistic conditions. FSOs then watched the original NTC battle on tape and evaluated their plans against the one used.

SFCs Joseph Jeffcoat and Steve Stone, 1-14 FA, check off convoy vehicles arriving for loading on board ship.



Btry A, 13th FA (MLRS), shoots during a live-fire exercise at Fort Stewart.

The Div Arty also extensively evaluated fire support in conjunction with the maneuver brigade's NTC preparation and ARTEPs. This eight-day exercise used evaluators, fire markers and AARs to train fire supporters from platoon to brigade level for the NTC.

The arrival of OH58D helicopters in June added a new perspective to the way we engage targets. The Div Arty is integrating this valuable asset into every training event.

Our initiatives ensure the artillerymen of the 24th Infantry Div Arty continue to be an integral part of the Victory Division—***First to Fight.***

25th Infantry Division (Light) Artillery

Last year has been extremely busy for the 25th Infantry Div Arty, with our battalions or batteries deployed to all major exercise areas: Korea, Japan, Panama, Australia, the Philippines and Thailand. The Div Arty's mission in the Pacific remains dynamic and demanding as we maintain our ability to deploy and fight in a low-, mid- or high-intensity conflict.

Hawaii's several military bases and the close proximity of our sister services greatly enhance our ability to conduct joint training. In March, the Div Arty sponsored a very successful Pacific Army Management Seminar on the Island of Hawaii with 75 delegates representing 30 Pacific armies attending. Attack helicopters from the Hawaiian ARNG and close air support from the 1st Marine Expeditionary Brigade and infantry, artillery, and support elements of the Division conducted a joint live-fire exercise. In addition, the assignment of a Marine artillery officer as the Div Arty assistant S3 enhanced our ability to conduct joint operations.

During August, the entire Div Arty deployed to the island of Hawaii for a live-fire exercise. It was the first time the 80 howitzers of our four battalions and separate 155-mm battery have massed fires. We successfully fired more than 900 missions and 30 air assaults and completed a battalion external evaluation.

In October, the Div Arty supported the Division's first rotation to the Joint Readiness Training Center by sending a direct-support battery and the battalion tactical operations center to Fort Chaffee, Arkansas.

"Tropic Lightning" strikes on the island of Hawaii.

The 25th Infantry Div Arty, which has the most deployed artillery organizations in the Army, continues to prepare for our challenging missions throughout the Pacific.

A 105-mm howitzer insertion during an assault for a Pacific Army Management Seminar.

Silhouettes of Steel

26th Infantry Division Artillery

Btry E (TA), 211th FA, emplaces the Q37 radar in 17 minutes, beating the 30-minute ARTEP standard.

The 26th "Yankee" Infantry Div Arty (Massachusetts ARNG) was reorganized during the period 1 April through 1 June 1988. The reorganization resulted in locating subordinate units in three of the New England states. It also resulted in new weapons systems in three of the battalions and, consequently, a return to the basics in section training.

The current units of the 26th Div Arty are the—

- 1st Battalion, 101 FA (DS), a 3x8 M114A1 unit in Massachusetts.
- 2d Battalion, 192 FA (DS), a 3x6 M114A1 unit in Connecticut.
- 1st Battalion, 86 FA (DS), a 3x6 M109A3 unit in Vermont.
- 1st Battalion, 211 FA (GS), a 3x4 M110A3 in Massachusetts.
- E Battery (TA), 211 FA, a Firefinder unit in Massachusetts.

Our DS self-propelled battalion was the only unit not receiving a new system; the other three battalions returned to basic training. The annual training periods for these battalions was in three 3-day segments: section, battery and battalion training.

We used the "walk-before-running" approach to develop the units' familiarity with the equipment and procedures and their confidence, allowing some battalions to perform their missions by the end of the third segment.

Of particular note was the fine training for the new Firefinder radars. The accuracy and ability of the weapon system impressed our soldiers. Elements of the target acquisition battery supported Div Arty elements both at Fort Drum, New York, and CFB Val Cartier in Quebec Canada.

The 26th Yankee Infantry Div Arty is *firing away* to lead other elements of the reorganized Division in a return to a high-level state of readiness.

28th Infantry Division Artillery

This year has been a dynamic Year of Training for the 28th Div Arty (Pennsylvania ARNG). In March, F Battery (TA), 109th FA, received the Firefinder radar. This family of Q-36 and Q-37 radars greatly enhances the TAB's ability to locate targets, thereby, enabling the 28th Div Arty to mass fires—killing the enemy and conquering the territory for our infantry to occupy.

Our largest activity of the year was participating in FIREX 88 at Dugway Proving Grounds, Utah. For more than 2,000 miles of travel, the 28th Div Arty coordinated the movement of more than 300 wheeled vehicles by rail and 600 personnel by air to participate in this I Corps exercise. Soldiers departed from five locations in Pennsylvania, flew to Utah, married up with their equipment and occupied field locations within 12 hours. At the same time, the 28th Div Arty controlled battalions training at Fort Pickett and A.P. Hill, Virginia, one of which successfully completed its standardized external evaluation.

Soldiers of the 1-109 FA have challenging training to put steel on target and survive to fight again.

During the 28th Division's annual skills competition, the Div Arty demonstrated the results of its training program by taking First Place on the .45 Caliber Pistol Team and in the Combat Medic, Army Physical Fitness Test and the Light Antitank Weapon competitions. We also took Second Place using the Infantry's primary weapon system, the M16 rifle.

The 28th Div Arty enters training year 89 with a new commander and the same dedication to realistic, challenging training that makes the 28th Infantry Div Arty the power behind America's oldest Division.

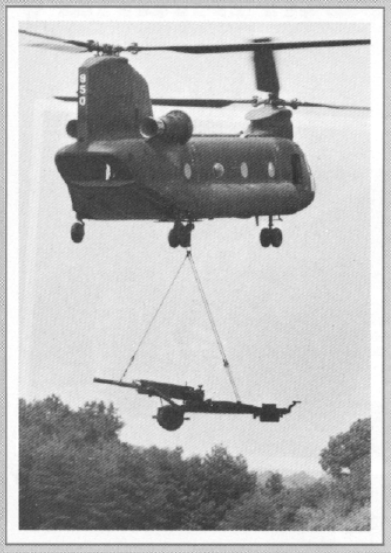
29th Infantry Division (Light) Artillery

As the Total Army's only Reserve Component Div Arty under the light infantry concept, the 29th Div Arty (Virginia ARNG) parallels the Active Component Div Artys. The 29th Div Arty reorganized with three direct-support 105-mm (M102) battalions, a 155-mm (M198) general-support battery and our Div Arty Headquarters.

The 29th Div Arty has passed many reorganization milestones. Our units are stationed across 14,000 square miles in Maryland and Virginia. This challenge to command and control calls for unique training to prepare us for contingencies and potential command relationships. Every battery displacement to a training site is a deployment exercise, improving readiness by testing SOPs, load plans, convoy procedures and other deployment objectives. This year, the Div Arty deployed by air, rail or motor vehicle in 17 battery- and 24 battalion-sized operations.

During our maturation, we have gained expertise and new equipment, and achieved some firsts. One first was a live-fire exercise at the Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas, by B Battery, 2d Battalion, 110th FA. Another plus was receiving new equipment under the Army's Force Modernization Program, requiring extensive new equipment training. Combined with CPXs, Army training battle simulation system (ARTBASS) participation, five standardized external evaluations (SEEs) and the Fire Support Element's deployment to Panama, this year gave us a strong base upon which to grow.

Trained to support light infantry in low- to high-intensity conflicts, our capabilities will continue to improve with new equipment—light TACFIRE in 1989. Equipment upgrading will ensure the 29th Div Arty is ready to provide timely and accurate fires whenever and wherever needed.



Btry A, 2-110 FA, practices sling-load operations as part of the only RC light IN Div Arty.

35th Infantry Division (Mechanized) Artillery

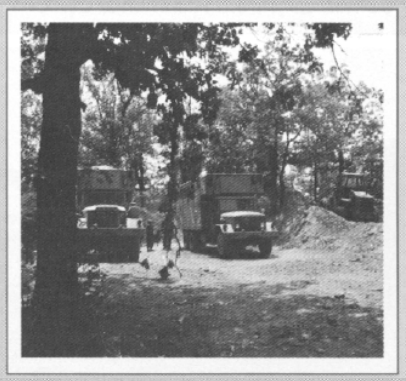
The Redlegs of the Santa Fe Division have matured during their three years as the 35th Infantry Div Arty (Kansas ARNG) and can support our heavy Division in combat. The 35th Div Arty is the result of the reorganization of the 67th and 69th Separate Mechanized Infantry Brigades in Nebraska and Kansas, respectively, and the 149th Separate Armor Brigade in Kentucky. These direct-support battalions, in addition to the 1st Battalion, 161st FA (8″), Dodge City, Kansas, comprise the 35th Div Arty.

Several activities contributed to the successful development of the 35th Div Arty. There was superior cooperation between the Div Arty commander and the battalion commanders of 1st Battalion, 168th FA, (Nebraska ARNG) and 2d Battalion, 138th FA, (Kentucky ARNG) who are under their State Adjutant General chains of command.

We had an extremely helpful directed training association (DTA) with the 1st Infantry (Mechanized) Division Artillery, Fort Riley, Kansas, until 1 October 1988 and with the 5th Infantry Division (Mechanized) Artillery, Fort Polk, Louisiana.

The most important event this year was fielding new equipment for E Battery (-) (TA), 161st FA. In May, the TAB completed training on the Q36 and Q37 Firefinder radars.

The 35th Div Arty looks forward to training with the Division at Pinon Canyon Maneuver Site and Fort Carson, Colorado. Our HHB and TAB will, for the first time, train in an extended field exercise with the Division and, at the same time, help administer two standardized external evaluations (SEEs). The 35th Div Arty—training as we'll fight.



Engineers from the Texas ARNG dig an emplacement for the Div Arty TOC at Fort Chaffee.

Btry E (TA), 161st FA, makes a hasty emplacement of the Q36 Firefinder.

Silhouettes of Steel

38th Infantry Division Artillery

The "Avengers of Bataan" prepare to fire their M102, 105-mm howitzer.

Massed fires at the right time and place is the focus of training in the 38th Infantry Div Arty (Indiana ARNG). Annual training culminated with a program of fires dedicated to the out-going Div Arty commander and synchronized with Saint Barbara's lighting.

The Division's battle focus for the Army's Year of Training was "Do Hard Tasks Often." The Div Arty's task to "attack targets" was done often during annual training. A rear passage-of-lines exercise, including battalions' rearming, refueling and resupplying enroute to new firing positions, was the command and control task chosen as the battle task for movement.

Each element in the 38th Div Arty habitually deploys 150 to 600 miles to attend annual training. The 1st Battalion, 163d FA (105-mm T), and a Q-36 section of E Battery (TA), 139th FA, deployed about 600 miles from Evansville, Indiana, to Camp Shelby, Mississippi, for a standardized external evaluation (SEE). The 1st Battalion, 119th FA (105-mm T), and a Q-36 section of E Battery (TA), 139th FA, deployed from Lansing to Camp Grayling, Michigan—about 150 miles for a SEE. The Headquarters and Headquarters Battery and E Battery (TA), 139th FA (-), both of Indianapolis; 2d Battalion, 150th FA (155-mm T/8″), Bloomington, and 3d Battalion, 139th FA (105-mm T), of Crawfordsville, deployed about 400 miles to Camp Grayling in August for a 10-day field exercise as part of their annual training.

With the able help of the 9th Infantry Division (Motorized) Artillery, the artillerymen of the 38th Div Arty—***Avengers of Bataan***—train for combat excellence.

40th Infantry Division (Mechanized) Artillery

The training mission of the "Fighting Fortieth" Div Arty is to train its subordinate battalions to deliver timely, accurate fires and survive to support the 40th Division.

Annual training found the Div Arty HHB, F Battery (TA), 144th FA, and our general-support 1st Battalion, 144th FA, participating in FIREX 88, an I Corps Artillery exercise at Dugway Proving Grounds, Utah. Our participation was a great training success because of our soldiers' flexibility and our staff's quality planning before we deployed. We practiced mobilization by using the transport we'd use during an actual mobilization—air, rail and wheeled convoy. FIREX 88 was a unique opportunity to exercise command and control of our habitually reinforcing brigade, the 57th FA Brigade (Wisconsin ARNG).

Last year, the Div Arty fielded the new Q36 and Q37 Firefinder radars. We used these radars extensively to support the counterfire battle at FIREX 88.

The FIREX 88 was not the only event we supported. The 40th Div Arty provided extensive fire support and evaluator cells to the 2d Infantry Division for Team Spirit in Korea and the I Corps exercise at Cascade Peak, Washington. We also conducted a successful standardized external evaluation for our direct-support 1st Battalion, 143d FA (155-mm SP), from Richmond, California. Our other two direct-support battalions, 2d Battalion and 3d Battalion, 144th FA, supported their brigades during two separate annual training periods.

In 1989, we'll continue to emphasize fire support and command and control, working with the 57th FA Brigade to provide ***Fighting Fortieth Firepower.***

LTC Otis W. Watkins

"Shot, over!" Btry B, 3-144 FA, provides the "Fighting Fortieth Firepower."

42d Infantry Division Artillery

The 42d Div Arty (New York ARNG) had consolidated fire support training for all 13F personnel at Camp Smith. The program was a success with our soldiers who completed the training receiving certificates of proficiency.

With the help of Readiness Group Stewart, we had a Field Artillery Junior Leaders Course at Camp Smith. Our 13B NCOs and officers through the rank of captain received this valuable training. It prepared our junior leaders for annual training and internal ARTEPs and standardized external evaluations (SEEs).

The Div Arty Headquarters successfully administered internal ARTEPs to the 1-187th Field Artillery in late June at Fort Drum. During the same period, we participated in a Division field training exercise with the 1-187 FA and 1-258 FA.

From mid-June to early September, the 42d Div Arty and the 101 Air Assault Div Arty successfully administered SEEs to the 2-104 FA and 1-209 FA. We're proud the 1-209 FA met the SEE standards for delivering conventional Field Artillery fires and operational tasks, and the 2-104 FA met the standard for delivering Field Artillery fires and operational tasks.

Our HHB successfully completed a readiness mobilization exercise in early August at our home station. The State Area Readiness Command of New York conducted the exercise.

In mid-September, the 42d Div Arty and its subordinate battalions had a command post exercise at Camp Shea. The 87th Maneuver Area Command from Birmingham, Alabama, produced and controlled the exercise. All Div Arty tactical operations and logistical operations centers operated in a tactical field environment continuously—24-hour-a-day operations is our business.

ISG Charles Russell

Soldiers of A Btry, 2-104 FA, direct fire their M101A1 howitzer at Fort Drum.

47th Infantry Division Artillery

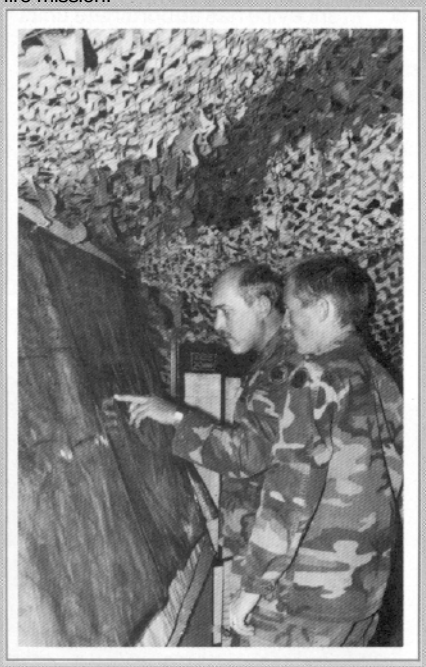
During training year 1988, the 47th Infantry Div Arty (Minnesota ARNG) developed an aggressive program to support the Division in the Battle Command Training Program (BCTP), Warfighter 88-3. The 47th Infantry Division was the first Reserve Component division to complete this exercise.

Much of our training in 1988 focused on developing Warfighter skills. In April 1988, the Div Arty conducted a combined-arms situational training exercise. The intent of the exercise was to bring together the combined-arms team working in synchronization to achieve maximum effective combat firepower. The document used to plan this exercise was *TC 6-71 Fire Support Handbook for Maneuver Commanders.* This combined-arms exercise brought together resources from the Field Artillery School, 4th US Army, Readiness Group Fort Snelling, Minnesota, and organic elements of the 47th Infantry Division. The exercise was a complete success and was an excellent train-up for War fighter 88-3.

The E Battery, 151st FA (TA), the 47th Div Arty's organic target acquisition battery, received the AN/TPQ36 and AN/TPQ37 Firefinder radar systems during training year 1988. We received the radars and new equipment training at Camp Ripley, Minnesota, in August. These systems drastically improved the Div Arty's ability to support the Division in target acquisition and counterfire.

The training focus for the 47th Div Arty in 1989 is to sustain the skills developed during the Warfighter 88-3 training exercise and continue to train and improve the Division's fire support system.

Soldiers of B Btry, 151st FA, in action during a fire mission.



LTC L. O. Bode (Left), S3, and CPT W. M. Haynes make plans during BCTP Warfighter 88.

49th Armored Division Artillery

This year was extremely busy for the 49th Div Arty (Texas ARNG). The most significant event was the reorganization of the Div Arty: the 1-133 FA in Houston was transferred to the 36th Infantry Brigade, and a new battalion, the 3-132 FA (155-mm SP), was formed in San Angelo, Texas. Its HHB and service battery were formed from a tank company, A Battery was formed out of an engineer company, and B and C Batteries were organized out of other battalions in the Div Arty. This year we also changed the calibers in two of our battalions. The 2-131 FA in Wichita Falls converted from 155-mm to 8″, and the 3-133 FA in El Paso converted from 8″ to 155-mm.

Annual training 88 was a busy time for Div Arty units. In June, the 2-131 FA went on its annual training with the 50th Infantry Division to Fort Drum, New York. The 3-112 FA from New Jersey participated in the 49th's annual training at Fort Hood in July. During annual training 88, the 4-133 FA of New Braunfels had a very successful standardized external evaluation followed later in the year by an equally successful technical validation inspection. Virtually all the soldiers of the 3-132 FA had training to qualify in their new MOS skills.

With 1988 now behind us, the 49th Div Arty eagerly anticipates the challenges of 1989. Our training is on target.

The 49th Div Arty—
Reorganized and Ready!

50th Armored Division Artillery

The 50th Div Arty (New Jersey ARNG) with headquarters in Lawrenceville has subordinate units in New Jersey, New Hampshire and Texas. All our units are on a three-year Reserve Component cycle for ARTEPs and Forces Command's standardized external evaluation (SEEs). We're ably assisted by the Readiness Group from Fort Dix.

The 1-112 FA (155-mm SP) and the 4-112 FA (203-mm SP) completed SEEs and technical validation inspections. Our newest battalion, the 1-133 FA (155-mm SP), was activated on 1 June in Beaumont, Texas, and is just beginning its first three-year cycle.

The 50th Div Arty, like our active-duty counterparts, is focusing its attention on integrating fire support with maneuver units. Approximately 25 people went to the National Training Center with the 1st Cavalry Div Arty, Fort Hood, Texas, in early 1988.

During training year 88, 1-112 FA completed a full mobilization as part of Operation Golden Thrust at Fort Drum, New York. The 3-112 FA completed a full mobilization and two weeks of annual training at Fort Hood in July. Our general-support unit, the 4-112 FA, was in direct support of the 2d Brigade, 50th Division, during its annual training in August. The Battalion integrated fires in conjunction with the maneuver battalion ARTEPs.

The Div Arty Headquarters participated in Operation Laser Warrior in May with the Division Headquarters at Fort A. P. Hill, Virginia. Laser Warrior exercised the Headquarters staff and the Division's subordinate major commands in a realistic III Corps scenario. During this same period, the Div Arty Headquarters and Headquarters Battery completed an external ARTEP.

Our A Battery (TA), 197th FA, also completed an ARTEP. The 50th Div Arty prides itself in being a proficient member of the artillery community—ready to assume any mission during peace or conflict.

The 1-112 FA arrives at its mobilization site during Operation Golden Thrust.

82d Airborne Division Artillery

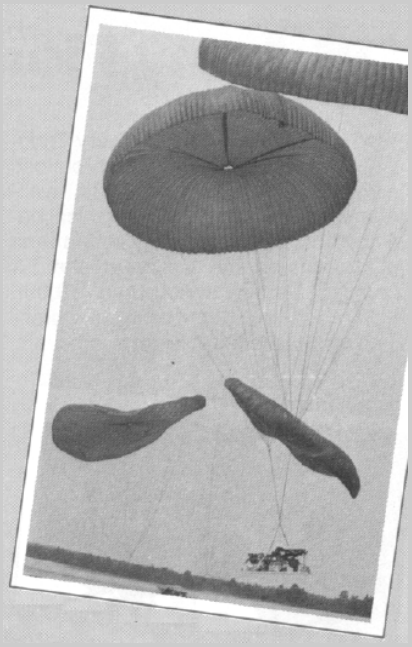
The 82d Airborne Div Arty's mission is to deploy with no notice anywhere in the world within 18 hours and fight and win once we're there. This requires intensive, demanding training and preparation to handle any situation or terrain the Div Arty could face.

In March 1988, the Div Arty expertly demonstrated its rapid deployment skills during Operation Golden Pheasant when elements of the 3d Battalion, 319th Airborne FA Regiment (AFAR), deployed to the Republic of Honduras as a symbol of US resolve to support our allies in the face of aggression. Additionally, Div Arty units sharpened their skills with many other deployments, to include exercises at Fort McCoy, Wisconsin; Puerto Rico; Fort Hood, Texas; Avon Park, Florida; 29 Palms, California; and during the first rotation to the Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas.

Among recent innovations, the 82d Div Arty has raised the level of fire support awareness of our maneuver counterparts by developing an effective firemarker system for all force-on-force maneuver evaluations at Fort Bragg. Relying on commonly available resources, this system simulates realistic fire support play like that of the JRTC and the National Training Center (NTC) at Fort Irwin, California.

To ensure the combat readiness of the 82d Div Arty's gunnery and fire support skills, every firing element's entire gunnery team was rigorously evaluated at least twice during the past year. All units performed exceptionally well and proved they're ready to accomplish their missions at a moment's notice.

Through their consistently outstanding actions, units of the 82d Div Arty have upheld the proud traditions of the US Army's only Airborne Field Artillery Regiment, the 319th.



An M102 howitzer from A Btry, 1-319 FA, descends into Fort Bragg's Normandy Drop Zone.

101st Air Assault Division Artillery

The Free World's only Air Assault Division and its Div Arty stand ready to deploy anywhere around the globe within 18 hours. With its abilities to go heavy or light, fight close or deep and move by air or ground, the Div Arty is prepared for its next "Rendezvous with Destiny."

Training remains the 101st Div Arty's priority, using the slogan, "Keep the Parts Trained." With renewed emphasis, the Div Arty's NCOs lead planning and executing "small parts training." One of our evaluation vehicles "driving" the small parts training is the Small Unit and Individual Evaluation (SUIE) program. The SUIE is an NCO-administered semiannual evaluation of sections or teams: howitzer, FIST, fire direction, survey, radar, ammunition, NBC, radio-teletype, wire, medical, special weapons and air defense. The program evaluates (written and hands-on) more than 400 tasks performed by approximately 1,000 soldiers having 12 MOSs.

For collective training of larger units, the battery and battalion external evaluations have increased in scope and duration. The evaluations of battery and battalion training remain the standardized external evaluations, emergency deployment readiness exercises and the command inspection program.

The 101st Air Assault Div Arty trains to deploy worldwide in 18 hours.

Div Arty-level emphasis is on training command post battle staffs during brigade-, division- and higher-level exercises. Two Div Arty initiatives of special note are forming a Targeting Cell at the Division Main CP and having the Div Arty TOC assume the role of the alternate Division Main CP. We've documented initiatives in SOPs and trained to standard as part of FTXs, CPXs and staff exercises.

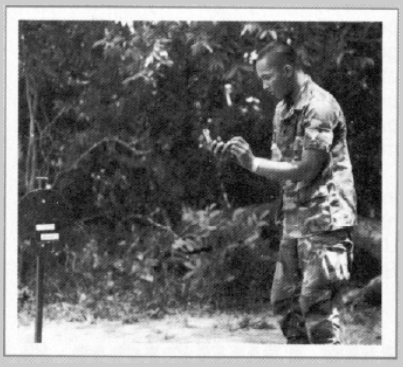
Our training and initiatives keep the 101st Div Arty—**the Air Assault Artillery**—ready and deployable worldwide in support of national policy.

US Army Field Artillery Training Center

The US Army Field Artillery Training Center (USAFATC) produces disciplined, physically fit, well-trained soldiers competent in critical basic combat skills and proficient in their MOSs. During the last year, the FA Training Center contributed 18,000 highly motivated and technically proficient soldiers to the total force.

The USAFATC provided 18,000 well-trained, physically fit soldiers for FA units in 1988.

The FA Training Center owns, operates and maintains 147 howitzer systems. We fire more than 85,000 artillery rounds each year—two and one-half times the amount of ammunition fired by a standard corps artillery during a comparable period. Our soldiers fired 16 million rounds of small-arms ammunition and threw more than 40,000 hand grenades.



The soldiers' hands-on training allows them to perform tasks longer with little or no reinforcement training.

We also own and operate 17 range complexes.

The initial entry training (IET) of soldiers is a "hands-on" business. Large lectures give way to small-group training that begins as a brief segment telling soldiers what they need to know followed by a substantial portion of practicing the skill. Our goal is to train a soldier to perform tasks at a much later time with little or no reinforcement training.

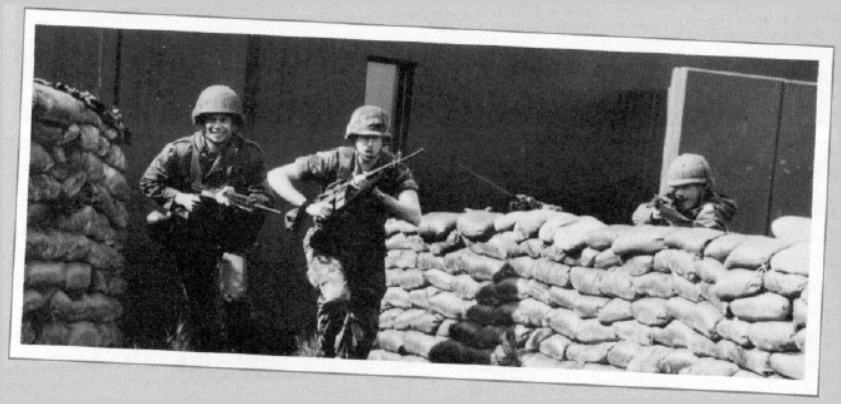
The Training Center is also home to the MLRS Collective Training Battery—D Battery, 1st Battalion, 78th FA. Our D Battery trains and tests units for deployment. Overseas-bound MLRS units train here at Fort Sill. They train as a unit for 10 weeks before receiving unit certification. Units assigned to the continental US train at their installations on their equipment under the supervision of a mobile training team from D Battery.

The Training Center will continue to accomplish its mission because the entire Branch depends on us for future Field Artillerymen—***Mission First—People Always.***

59th Ordnance Brigade

The Army's largest brigade, the 59th Ord Bde, is deployed throughout NATO's central region. With its five Arty Grps and three Ordnance battalions, the 59th uniquely meshes artillery and ordnance together to provide special-weapons and guided-missile support to five nations and two US corps. Our mission is often called the backbone of NATO.

Living and working with the allied artillery units they support provides the US Arty Grps unequalled training challenges daily. To ensure complete interoperability at all levels, the 59th's artillery units participate in every FTX and CPX the NATO units conduct, as well as their own and higher-level ARTEPs and major USAREUR exercises. These units use and, in many cases, maintain host nation equipment, communicate in multiple languages and live a new culture. They develop total familiarity with host-nation weapon systems and tactics.



While phasing out the Nike-Hercules system, the 5th FA Group, the Army's oldest, maintains combat readiness.

Most challenging this year has been restructuring the Brigade to support the phase out of the Nike-Hercules system and implementing the Intermediate-Range Nuclear Forces Treaty. We have successfully accomplished both these missions, maintaining readiness and minimizing personnel turbulence throughout our operations.

The 59th Ord Bde is leading, thinking, training and ready to fight as a cohesive Artillery-Ordnance team in harmony with our NATO Allies. We're the largest and most unique Brigade in the Army with ***Power to Spare.***

Artillerymen on the High Seas: The USMC

The United States Marine Corps Field Artillery has four regiments, each providing artillery and associated support for its parent Marine division. Each regiment has four or five battalions. The first, second and third battalions provide direct support to one of a division's Marine infantry regiments. Whenever possible, each battalion trains with its infantry regiment to foster efficiency through a habitual relationship. The fourth and fifth battalions, if present, provide general support for their Marine division.

MEU(SOC)

Some of the most exciting and challenging training and operations occurring in the Marine Corps today are with the Marine expeditionary unit (special operations capable) or MEU(SOC). The MEU(SOC) is the smallest Marine air-ground task force (MAGTF) and can perform a variety of missions. It has a command element, a battalion landing team (BLT), a composite helicopter squadron reinforced with AV-8B Harriers and an MEU service support group (MSSG). The MEU(SOC)s are constantly forwardly deployed to the Mediterranean Ocean with plans to make the MEUs in the Pacific similarly capable.

BLT

The BLT is a Marine infantry battalion task force organized with artillery, tanks, combat engineers, amphibious assault vehicles and other units the mission requires.

The Field Artillery unit usually attached to the BLT is a battery. This battery is typically a mix of M198 and M101A1 howitzers capable of airmobile operations and ranging deep targets. The battery's 3x8 structure reduces some of the confusion that having two weapon systems in the same battery might otherwise cause.

BLT Battery Operations

The battery begins "work-up" training with its BLT six months before embarking on a US Naval amphibious ship. A few of the missions the battery will train to perform include artillery raids, amphibious assaults, noncombatant evacuation operations, limited hostage rescue, civil actions and the maintenance of mobile training teams for allies. In addition, the battery can perform as a rifle company on a moment's notice.

The experience gained during the training and the six-month deployments make these MEU (SOC) Marines some of the most versatile artillerymen in the world.

Training

Regiments and battalions constantly train organic fire support assets in combined-arms exercises at 29 Palms, California. Units also exercise frequently at Fort Bragg, North Carolina; Fort Pickett, Virginia; Fort McCoy, Wisconsin; and their home bases. Outside of the continental United States, our units train in Hawaii, Japan, Korea, Norway, Alaska and Puerto Rico.

UDP

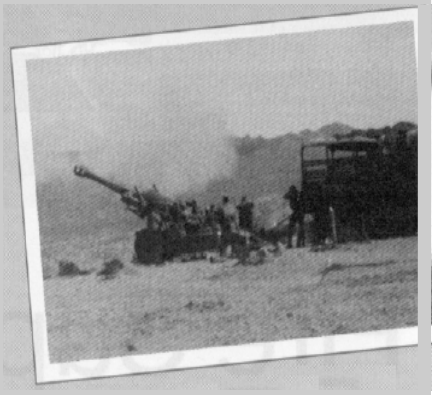
To standardize procedures and minimize personnel turbulence, we have the unit deployment program (UDP). In the program, batteries from the First and Second Divisions deploy to the Third Division in Okinawa; in turn, Okinawa sends batteries back in the same aircraft. The batteries deploy for six-month periods with only personnel moving in these deployments. The equipment remains with the parent battalion for the incoming battery. The Marine Corps emphasizes standard procedures to make this program work for infantry companies and aviation squadrons, as well as artillery batteries.

M Battery

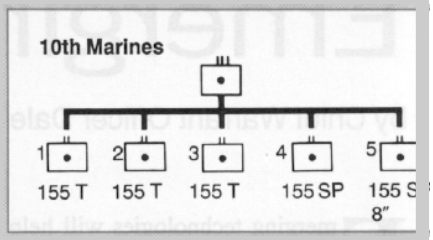
The "M" Battery, 1st Battalion, 78th Field Artillery, at Fort Sill, Oklahoma, trains graduates of the Marine Corps recruit training depots to be artillerymen. The M Battery trains students on the five artillery weapon systems currently in the Marine Corps. Marines qualify to hold all positions of a gun section from cannoneer to gunner and receive certifications for a myriad of other skills. After six weeks of intensive training, graduates receive the MOS 0811 Cannoneer.

Every Clime and Place

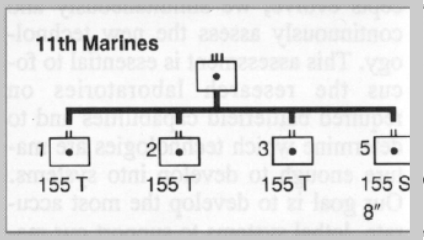
The Marine Hymn finds Marines . . . "in every clime and place." Marine Cannoneers are in the US, Northern Norway in support of NATO, the Mediterranean and Indian Oceans, the Far East and all points in between. Marine Corps Field Artillerymen train to discharge their mission **In Every Clime and Place.**



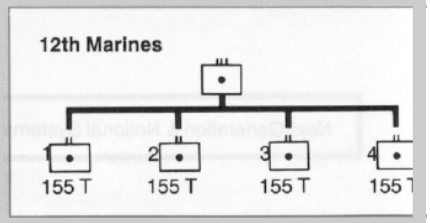
Btry D, 2/10 Mar, trains at 29 Palms.



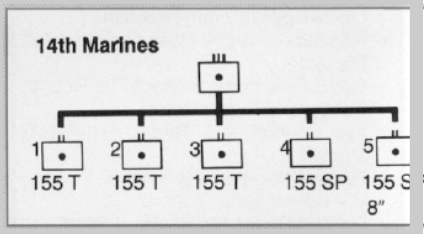
The 10th Marine Regiment supports the 2nd Marine Division.



The 11th Marine Regiment supports the 1st Marine Division.



The 12th Marine Regiment supports the 3rd Marine Division.



The 14th Marine Regiment supports the 4th Marine Division.

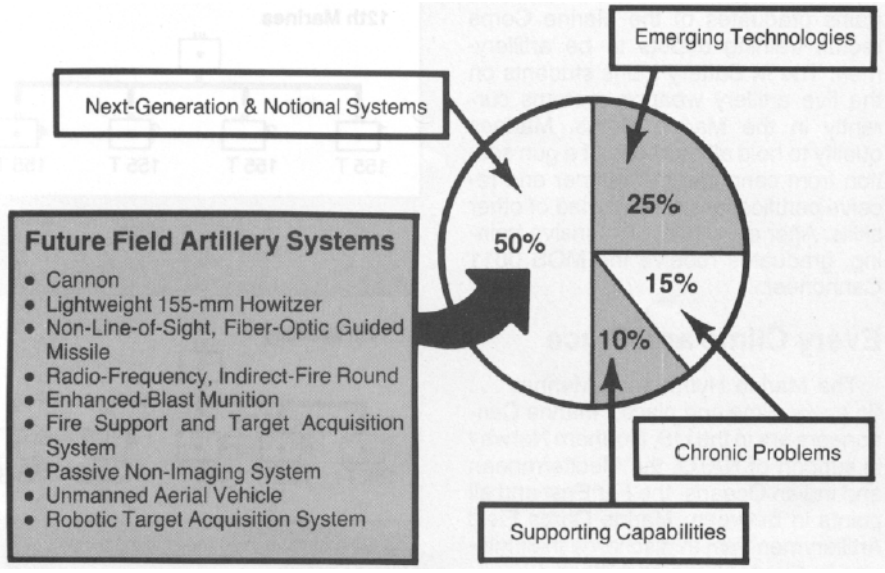
Fire Support's Future in Emerging Technology

by Chief Warrant Officer Dale C. Bailey (Retired)

Emerging technologies will help ensure fire support's future battlefield success. As future concepts evolve, we simultaneously and continuously assess the new technology. This assessment is essential to focus the research laboratories on required battlefield capabilities and to determine which technologies are mature enough to develop into systems. Our goal is to develop the most accurate, lethal systems to support our maneuver forces beyond the year 2000.

The Army's Laboratory Command (LABCOM), under the Army Materiel Command (AMC), manages this vast technology base known as the "Tech Base." The user's demands, stated as required battlefield capabilities, influences Tech-Base planning.

Next-generation and notional systems (NGNS) are part of the Tech-Base strategy. Next generation systems are generally ones that go beyond those in engineering development, while notional systems are a generation beyond that. Currently, we have approximately 50 NGNS in various phases within the Tech Base. These NGNS are 50 percent of the Army's Tech-Base budget.



Army Technology Base Investment Strategy

To most effectively support the maneuver arms in the future, the Field Artillery must focus on promising new technologies, keep the laboratories updated on battlefield requirements and influence the development of NGNS. Those technologies, requirements and developments translate into future Field Artillery systems.

Future Cannon

The highly mobile maneuver forces and extremely fluid battlefield require a cannon just as mobile as the forces it supports, and it'll have to be able to shoot on the move. The future cannon will be able to operate autonomously and incorporate technologies to reduce the numbers in the crew, increase survivability and greatly improve range. Advanced propellants will provide 50-kilometer ranges while robotics will allow for a reduced crew size and automatic ammunition handling, target selecting and fuzing. Automation will provide a high rate of fire.

The future cannon system will be less vulnerable to counterfire with the application of composite materials, and the addition of on-board directed-energy

and smart-munition sensors. This cannon will provide the mobility, agility and firepower needed on the battlefield in the 21st century.

Light Howitzer

As light forces respond to future worldwide contingencies, we'll need additional firepower. The future towed, lightweight 155-mm howitzer will retain the capabilities of the M198 howitzer but will have improved air and ground mobility. Ideally, this lightweight howitzer will replace all 105-mm and 155-mm towed howitzers.

The lightweight 155-mm towed howitzer will have a 30-kilometer assisted range. It'll incorporate a self-actuating breech and be able to fire the entire family of 155-mm munitions. The howitzer's reduced weight will require fewer crew members to handle it, and it'll break down into two airliftable components. The towed, lightweight 155-mm howitzer will provide a true fire support punch for light forces in the future.

Fiber-Optic Missile

Although not as far in the future as suggested by the use of the term NGNS, the non-line-of-sight Field Artillery (NLOS-FA) fiber-optic technology for guided missiles is in the latter development stages in the Tech Base. This future system will provide beyond-line-of-sight, precision target engagement.

The system will be self-locating and will incorporate on-board fire control. The NLOS-FA will be able to attack moving or stationary targets at a range of 20 to 30 kilometers through smoke and other obscurants on the battlefield. It'll have a high rate of fire and be able to attack multiple targets in successive engagements.

The NLOS-FA will support maneuver forces with divisional and non-divisional batteries. With the introduction of NLOS-FA, the enemy won't be able to escape detection and attack on the battlefield.

RF Electronic Warfare Round

Future directed-energy weapons will provide an alternate kill mechanism against electronic targets. These weapons will be extremely effective when we can't detect targets accurately enough to attack them with conventional or smart munitions.

A national laboratory is rapidly developing an indirect-fire radio frequency (RF) round. Currently, the technology is developed to the point where packaging is feasible in the size of a missile for the Army tactical missile system (Army TACMS). Future goals are to produce the RF round in multiple launch rocket system (MLRS) rockets and 155-mm cannon projectiles.

The RF round will render the electronics of moving and stationary, high-payoff targets useless throughout the corps area of operations. We'll package the RF round in conventional-geometry munitions.

The enemy may be camouflaged perfectly or completely hidden in a forest, but he won't escape the effects of an RF round impacting in his vicinity. Suddenly his electronics won't function, and he may not know the reason they failed.

Enhanced-Blast Munition

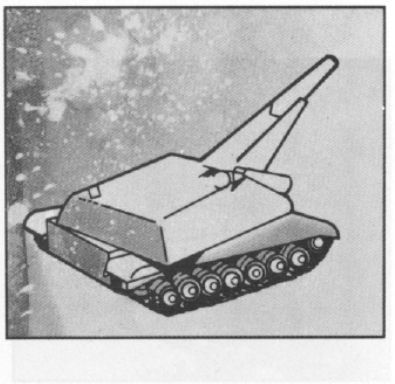
Another technology being aggressively pursued is the development of a fuel-air explosive munition known as enhanced-blast munition (EMB). The Air Force has done some work on an EBM, and the Navy has been successful in employing an EBM against personnel in the open and in light fortifications.

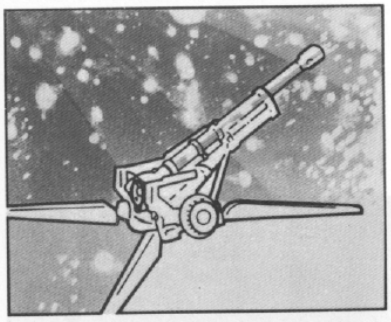
The EBM creates a more powerful blast than conventional munitions without the adverse effect of nuclear contamination. Some of the key targets we would engage with EMB would be those in defilade or under cover, armored vehicles, structures in military operations in urban terrain (MOUT) and ammunition and other logistical targets. Currently, it appears technologically feasible to package an EMB in an MLRS-size munition.

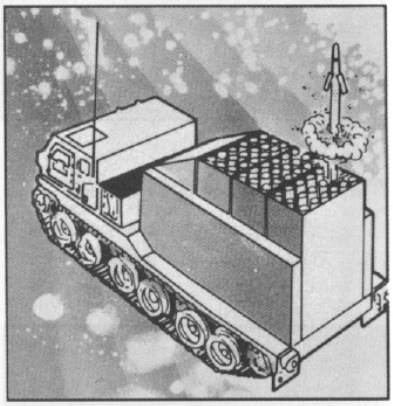
The Field Artillery School is completing the requirements document for EBM. Depending on funding, the School should test the technological concept in about two years.

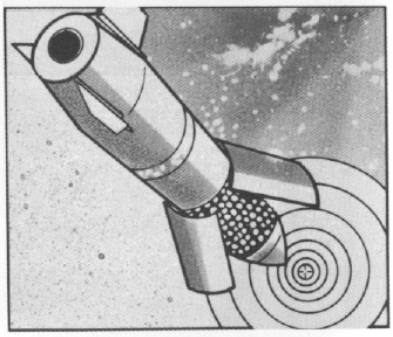
Target Acquisition

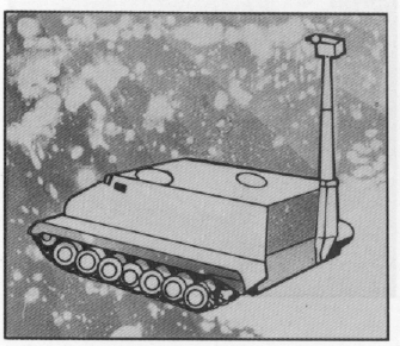
In the close battle, we can't see the battlefield beyond line of sight. This leaves the maneuver commander with a target acquisition void in the 5 to 30-kilometer range and in his over-the-hill capability.

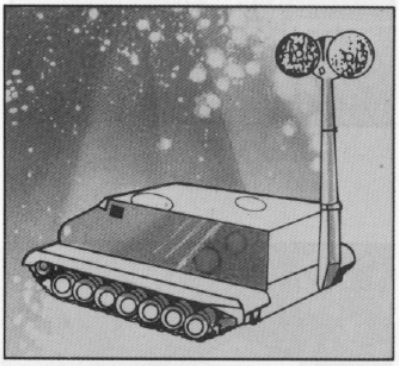


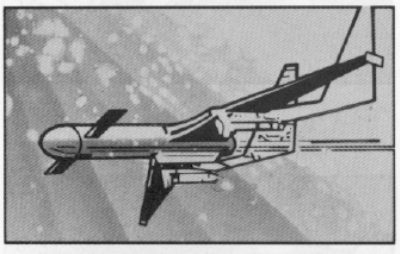












COLT Follow-On

In the future, we need a fire support and target acquisition system to acquire targets and assess their damage beyond line of sight out to 30 kilometers. Because of the curvature of the earth, we'll need an elevated sensor suite.

This system must be as mobile as the maneuver forces it supports and be able to locate targets on an obscured battlefield 24 hours a day in all weather. The sensor suite will be able to identify appropriate targets for specified munitions and acquire and process multiple targets. We expect this improved system to replace the combat observation and lasing team (COLT) systems in the maneuver brigades.

Passive Target Acquisition

We have other acquisition requirements on the future battlefield. Because of the sophistication of the enemy's target acquisition systems, we need passive target acquisition and target damage assessment abilities. Passive target acquisition will be a 24-hour-a-day, all-weather system to locate targets and provide target damage assessment out to the range of 30 kilometers on an obscured battlefield. The system will be able to locate targets within the accuracies required for specific munitions, i.e., conventional and smart. We'll be able to use this survivable passive system to cue other acquisition systems.

Unmanned Aerial Vehicles

The unmanned aerial vehicle (UAV) program at Fort Huachuca, Arizona, will provide aerial mission payloads to support the maneuver commander and provide targeting information for the Field Artillery. Because of current budget constraints, UAV development for all services is under a Secretary of Defense-sponsored program.

The Field Artillery needs a UAV that can acquire targets, perform target damage assessment and provide target area information to an accuracy of within 100 meters, operating out to at least 100 kilometers. These payloads must have a 24-hour-a-day, all-weather capability to locate moving and stationary targets and identify them for attack with specified munitions.

The UAVs will incorporate state-of-the-art, low-observable technology to ensure survivability. Mission payloads will be interchangeable between air vehicles. The UAV payloads will work digitally with command, control and communications nodes. They'll provide target damage assessment and target area meteorological information. Again, the enemy simply won't have anywhere to hide on the battlefield.

Robotic Target Acquisition

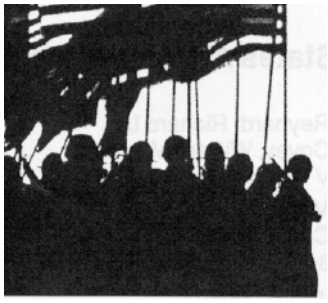
A future robotic system will add a new dimension to battlefield target acquisition. Robotics will provide a reliable, survivable acquisition and damage assessment capability beyond that of a manned line-of-sight system.

The future robotic target acquisition system will acquire, locate and identify targets and provide target damage assessment out to 30 kilometers on an obscured battlefield. It'll acquire and locate multiple targets simultaneously to an accuracy of 100 meters. This 24-hour-a-day, all-weather system will incorporate exchangeable mission payloads. The future robotic target acquisition system will operate autonomously or under the control of a master unit, posing minimal risk to our soldiers.

Conclusion

Fighting on the future battlefield will be fast and fluid. The maneuver forces will need highly mobile, accurate and lethal Field Artillery systems to provide firepower quickly at extended ranges. In partnership with the research laboratories, we must develop Field Artillery systems to ensure our forces get what they need for the 21st century battlefield—deadly firepower.

CW3 (Retired) Dale C. Bailey is a Field Artillery Specialist in the Concepts Division, Directorate of Combat Developments, Field Artillery School, Fort Sill, Oklahoma. He retired from active duty having served in 105-mm self-propelled, 8-inch howitzer and several aviation units. Chief Bailey has a bachelor's of science degree from Cameron University, Lawton, Oklahoma, and a Master's of Business Administration from Oklahoma City University.



Field Artillery Commanders and Command Sergeants Major

Note: *Listing as of 1 October 1988*

Active Army

Training and Doctrine Command

US Army Field Artillery School and Fort Sill

MG	Hallada, Raphael J. Commandant
CSM	Taylor, David P. Fort Sill
BG	Marty, Fred F. Asst. Commandant
COL	Scales, Robert H., Jr.
CSM	McElroy, Robert USAFATC
LTC	Jones, Alton E.
CSM	Cobb, Jesse 1st Bn, 19th FA
LTC	Beeson, Charles S.
CSM	Stanislas, Rawle B. 3d Bn, 22d FA
LTC	Cantrell, Alvin D.
CSM	Kermode, William J., Jr. 2d Bn, 30th FA
LTC(P)	Alton, John F.
CSM	Johnson, Richard G. 1st Bn, 31st FA
LTC	Dolton, Henry J., Jr.
CSM	Gaines, Crynell 1st Bn, 33d FA
LTC	Nelson, Neil E.
CSM	Jefferson, Henry C. 1st Bn, 78th FA
LTC	Frey, Kurt M.
CSM	Krause, Thomas B. 2d Bn, 80th FA
LTC	Hollingsworth, Stephen L.
CSM	Burk, Maxie L. 3d Bn, 321st FA
COL	Koontz, Ronald D.
CSM	Stewart, David P. FA School Bde
LTC	Berry, Guy A., Jr.
SGM	Carmichael, Kiden E. OSB Bn
MAJ(P)	Rawls, Buddy G.
CSM	Gower, George A. S&F Bn

Forces Command

III Corps

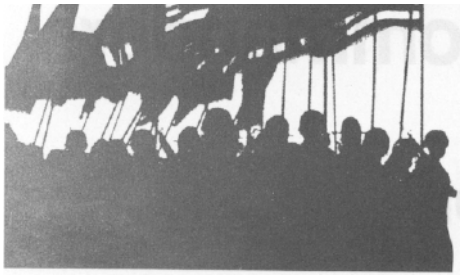
BG	Cole, David L.
CSM	Eldridge, Timothy U., Jr. III Corps Arty
COL	Barron, Max R.
CSM	Taylor, Rufus 75th FA Bde
LTC	Rhoades, George H.
CSM	Milam, Jake R. 1st Bn, 12th FA
LTC	Hardie, Rickey E.
CSM	Reed, James A. 1st Bn, 17th FA
LTC	Keating, Arthur J.
CSM	McFadden, Joseph J. 5th Bn, 18th FA
LTC	Schottel, David K.
CSM	Martin, Robert 6th Bn, 27th FA
LTC	Robyn, Eric W.
CSM	Blair, John O. 2d Bn, 34th FA
COL	Benton, David L., III
CSM	Brooks, Walter F. 212th FA Bde
LTC	Witherspoon, Richard H.
CSM	Dickey, Nixon 2d Bn, 17th FA
LTC	Allin, George R., III
CSM	Hawkins, Joseph A., Jr. 2d Bn, 18th FA
LTC	Roszkowski, Joseph A.
CSM	Harris, Willie J. 3d Bn, 18th FA
LTC	Sherwood, Richard W.
CSM	Walley, Marion O. 1st Bn, 20th FA (Fort Hood)
LTC	Sabia, Giacomo R.
CSM	Underwood, Curtis A. 6th Bn, 32d FA
COL	Bondshu, Arthur F.
CSM	Royal, Ira J. 214th FA Bde
LTC	Compton, George J.
CSM	Young, Richard A. 2d Bn, 2d FA
LTC	Cunningham, James E.
CSM	Thompson, Thomas H. 3d Bn, 9th FA

XVIII Airborne Corps

COL	Metelko, James E.
CSM	Woodley, John L. XVIII Abn Corps Arty/18th FA Bde
LTC	Edwards, Roy L.
CSM	Ford, James H. 3d Bn, 8th FA
LTC	Lovelace, James J., Jr.
CSM	Elder, Robert E. 5th Bn, 8th FA
LTC	Drinkwater, John P.
CSM	Johnson, Shelton 3d Bn, 27th FA
LTC	McNutt, William A.
CSM	Dixon, Donald L. 1st Bn, 39th FA(Abn)

Division Artilleries

COL	Franks, Tommy R.
CSM	Kral, Robert A. 1st Cav Div Arty
LTC	Persyn, Charles E.
CSM	Hodrick, John, Jr. 1st Bn, 82d FA
LTC	Chambless, James R.
CSM	Cates, David L. 3d Bn, 82d FA
COL	Roberts, James F., Jr.
CSM	Najar, Joe C. 1st IN Div Arty
LTC	Lacy, Warren S.
CSM	Manning, Curtis E. 1st Bn, 5th FA
LTC(P)	Sander, Robert D.
CSM	Roberts, Daniel J. 4th Bn, 5th FA
COL	Roberts, William F.
CSM	Edmundson, Thomas J. 2d AR Div Arty
LTC	Trimble, Joe W.
CSM	McNair, Liddell 1st Bn, 3d FA
LTC	Stricklin, Toney
CSM	McClain, Robert L. 3d Bn, 3d FA



COL Beddingfield, Robert E.
CSM Belford, Frank
4th IN Div Arty
LTC Jackson, James H.
CSM Holmes, Timothy
1st Bn, 29th FA
LTC Landrum, J. Michael
CSM Mason, Henry T.
3d Bn, 29th FA
LTC Lennox, William J., Jr.
CSM Cupp, Lonny J.
5th Bn, 29th FA
COL Ballagh, Robert S., Jr.
CSM Bynog, David L.
5th IN Div Arty
LTC Martin, Michael C.
CSM Chittum, Steven G.
4th Bn, 1st FA
LTC Broadwater, Colby, III
CSM Brown, George D.
5th Bn, 1st FA
COL Hamilton, Mark R.
CSM *Vacant*
6th IN Div Arty
LTC Leigh, Joseph J., Jr.
CSM Anderson, David A.
4th Bn, 11th FA
LTC Hulin, Terry M.
CSM Stroupe, Donald E.
5th Bn, 11th FA
COL DeFrancisco, Joseph E.
CSM Josey, Randall D.
7th IN Div Arty
LTC Baltimore, Perry F.
CSM Shrewsberry, Harold
2d Bn, 8th FA
LTC Brown, Richard L.
1SG Baskin, Leo
6th Bn, 8th FA
LTC Miller, Geoffrey D.
CSM Robinson, Benjamin
5th Bn, 15th FA
LTC Dooley, Joseph C.
1SG Inman, Paul M.
7th Bn, 15th FA
COL Sinnreich, Richard H.
CSM Aguigui, Doroteo Q.
9th IN Div Arty
LTC Cochran, Ronald R.
CSM Powell, Twin L.
1st Bn, 11th FA
LTC Lucas, Ronald J.
CSM Phillips, Richard A.
3d Bn, 11th FA
LTC Rice, William J.
CSM Underwood, Johnny W.
1st Bn, 84th FA
COL Van Horn, Fredrick E.
CSM Sexton, Robert C.
10th Mtn Div Arty
LTC Nell, Paul E., Jr.
CSM Howell, John C.
1st Bn, 7th FA
LTC Davidson, Donald G.
CSM Hartman, Robert
2d Bn, 7th FA
COL Rolston, David A.
CSM Crowe, Willie C.
24th IN Div Arty
LTC O'Brian, Michael D.
CSM Jones, David A.
1st Bn, 14th FA
LTC Warner, Michael L.
CSM Williams, Laurence
1st Bn, 41st FA
LTC Fox, Alan A.
CSM Jordan, Charles
3d Bn, 41st FA
COL Willis, Deral E.
CSM Holland, Jimmy
82d Abn Div Arty
LTC Tighe, Dennis W.
CSM Austin, Johnnie J.
1st Bn, 319th FA
LTC Clemmons, Reginal G.
CSM Tukes, Samuel L.
2d Bn, 319th FA
LTC Gottardi, Larry D.
CSM Acosta, Felix
3d Bn, 319th FA
COL Brickman, James F.
CSM Bakos, Janos
101st AA Div Arty
LTC Meyers, John H., II
SGM Allen, David A.
2d Bn, 31st FA
LTC Rouquie, Gabriel, Jr.
CSM Hern, Charles R.
1st Bn, 320th FA
LTC(P) Fullenkamp, Leonard J.
CSM Dulin, Harry E., Jr.
2d Bn, 320th FA
LTC Pembrook, Wayne R.
CSM Norvell, Larry J.
3d Bn, 320th FA

Separate Commands

LTC Williams, Stephen D.
CSM Tucker, Edwin J.
1st Bn, 77th FA
194th AR Bde
LTC Lackey, Glen G.
CSM Kirchhoff, Lyle R. R.
2d Bn, 10th FA
197th IN Bde

United States Army, Europe
V Corps

BG Reynard, Richard L.
CSM Covey, William M.
V Corps Arty
COL Magruder, Robert B.
SGM Carr, Thomas E.
3d AR Div Arty
LTC Irick, Edward F.
1SG Martin, Lamar R.
(Acting)
2d Bn, 3d FA
LTC Scales, Roy T.
SGM Ensign, Gary D.
2d Bn, 82d FA
LTC Strom, Stephen H.
SGM Flores, Francisco R.
4th Bn, 82d FA
COL Pickler, John M.
CSM Morant, Benny J.
8th IN Div Arty
LTC Chapman, Raymond M.
CSM Parsons, Robert E.
2d Bn, 29th FA
LTC Dayton, Keith W.
1SG Blackwell, Glenn A.
(Acting)
4th Bn, 29th FA
LTC Brown, Walter B.
CSM Allen, Bobby W.
6th Bn, 29th FA
COL Schulte, David A.
CSM Carey, Michael
41st FA Bde
LTC Resnick, Allan M.
CSM Devoe, Walter
4th Bn, 18th FA
LTC Adams, Lonnie B.
CSM Wood, David C.
1st Bn, 27th FA
LTC Calhoun, John P.
CSM Edwards, Alfred G.
1st Bn, 32d FA
LTC Burns, Michael A.
CSM Dalton, Joseph L.
2d Bn, 75th FA
LTC Edney, Kermit, Jr.
CSM Harrison, Eddie L.
4th Bn, 77th FA
COL Roe, Raymond T.
CSM Haynes, Ellis J.
42d FA Bde
LTC Lucas, Michael D.
CSM Reynolds, Raymond H.
5th Bn, 3d FA
LTC Evans, Richard E.
CSM Smith, Walter L.
4th Bn, 7th FA
LTC Henderson, James W.
CSM Toliver, Ronald E.
2d Bn, 20th FA
LTC Jolissaint, James M.
CSM Duggins, Kalub D.
2d Bn, 32d FA

LTC Jonas, Clyde L.
CSM Graham, Roger T.
3d Bn, 32d FA

VII Corps

BG(P) Del Rosso, Louis J.
CSM Pippin, Larry V.
VII Corps Arty
COL Dubia, John A.
CSM Hamilton, Delano R.
1st AR Div Arty
LTC Cooper, Billy R.
CSM Howard, Preston B.
2d Bn, 1st FA
LTC Starner, Steven G.
1SG(P) Porter, Robert W.
(Acting)
3d Bn, 1st FA
LTC Lambert, Alan E.
CSM Wright, Daniel E.
6th Bn, 1st FA
COL Karr, Thomas W.
CSM Calloway, Robert E.
3d IN Div Arty
LTC Merritt, Keith F.
CSM Riggs, Glenn L.
2d Bn, 41st FA
LTC Paolucci, John N.
CSM McKinney, James C.
5th Bn, 41st FA
LTC Bolger, John T.
CSM Lugo-Rivera, Luis A.
6th Bn, 41st FA
COL Anderson, Edward L., III
CSM Higginbotham, Walter
17th FA Bde
LTC Bowers, William
CSM Shimezu, Antonio
4th Bn, 12th FA
LTC Wittenburg, Stephen
CSM Mitchell, Joe W.
1st Bn, 18th FA
LTC Valenzuela, Alfred
CSM Wills, Michael
1st Bn, 36th FA
LTC Jones, William
CSM Rundle, Dennis
2d Bn, 77th FA
COL Hegg, George
CSM Barber, David P.
72d FA Bde
LTC Christopher, Paul E.
CSM Villines, Kenneth
3d Bn, 12th FA
LTC Perry, Howard F., III
CSM Thomas, Curtis E.
2d Bn, 14th FA
LTC Monette, Theodore A., Jr.
CSM Kilroy, John F.
4th Bn, 14th FA
LTC Newell, James W., Jr.
CSM Colquitt, Bobbie
4th Bn, 27th FA
LTC Rains, Roger A.
CSM Noel, Thomas E.
3d Bn, 35th FA
COL Vernon, Edwin T.
CSM Field, Charles A.
210th FA Bde
LTC Toops, David
CSM Byrum, Johnnie
3d Bn, 5th FA
LTC Kimball, Robert H.
CSM Boone, Robert L.
2d Bn, 12th FA
LTC Griffin, Gary B.
CSM Watters, Doyle
3d Bn, 17th FA
LTC Williams, Bristol
CSM Del Rosario, Rodrigo
5th Bn, 17th FA

56th Field Artillery Command

BG(P) Bean, Roger K.
CSM Tompkins, Ian R.
56th FA Cmd
LTC Shadburn, Robert P.
CSM Irving, Herman E.
1st Bn, 9th FA
LTC Pasquarett, Michael J.
CSM Lopes, Lucio O.
2d Bn, 9th FA
LTC Varsolona, Frank L.
CSM Smith, Fred F.
4th Bn, 9th FA

59th Ordnance Brigade

LTC Johnson, Jeffrey M.
CSM West, Joseph C.
294th Arty Group
LTC Perkins, Ellis C., Jr.
CSM Steen, Robert N.
512th Arty Group
LTC Witschonke, Carl F.
CSM Carnegie, Guillermo E.
552d Arty Group
LTC Spengler, John C.
CSM Nave, James C.
557th Arty Group
LTC Morelock, Jerry D.
CSM Knight, Donald L.
570th Arty Group

Southern European Task Force

COL Ames, Robert
CSM Stokes, Ellis H.
528th Arty Group
COL St. Amant, Philamon
CSM Brewington, Avon
558th Arty Group
COL Smith, Tommy J.
CSM Meredith, Henry R.
559th Arty Group

Separate Commands

COL Sanchez, Washington J., Jr.
CSM Hill, Tellis R.
Grafenwoehr TA
LTC Byrnes, Kevin P.
CSM Holmes, David P.
4th Bn, 3d FA(2d AD Fwd)
LTC Culling, Thomas E.
CSM Hill, Jerry A.
2d Bn, 5th FA(1st ID Fwd)
LTC Marcello, John J.
CSM Clark, Lorenzo
Cbt Spt Bn, Berlin Bde

Western Command

COL Lackey, Jimmie R.
CSM Donn, Wayne H.
25th IN Div Arty
LTC Carson, Robert G., III
CSM Murrell, Angelo B.
3d Bn, 7th FA
LTC Tucker, Ronnie W.
CSM Gates, Charles E.
1st Bn, 8th FA
LTC Sakuma, Steven M.
CSM Hipp, Virgil L.
7th Bn, 8th FA
LTC Churchill, Ralph B.
CSM Graves, Roy L.
2d Bn, 11th FA

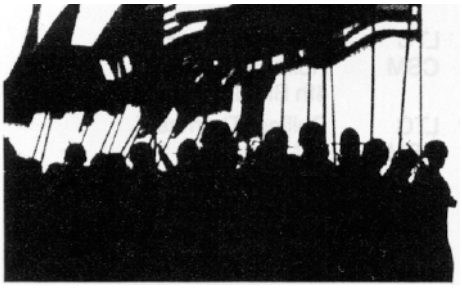
Korea and the Eighth Army

COL Campbell, Delwin M.
CSM Thomas, E. J.
2d IN Div Arty
LTC Glacel, Robert A.
CSM Williamson, Guy
1st Bn, 4th FA
LTC Crawford, Steven L.
CSM Marable, Joseph L.
8th Bn, 8th FA
LTC Kerr, Donald L.
CSM Johnson, Robert
1st Bn, 15th FA
LTC Smith, David O.
CSM Dixon, Joe E.
6th Bn, 37th FA
COL Simino, Joseph R.
CSM Bush, Charles L.
Eighth Army Sp Trps Cmd, Korea
LTC Blose, Michael D.
ISG Jordan, Chester J.
Sp Wpns Spt Det, Korea

Army National Guard

I Corps

BG Miller, James M.
CSM Lunceford, Kenneth C.
I Corps Arty
LTC Eichers, Brent S.
CSM Nelson, John W.
1st Bn, 140th FA



LTC Gillenwater, Lee T.
CSM Williams, Brock
1st Bn, 145th FA
MAJ Scott, George M.
CSM Bishop, Kent A.
2d Bn, 222d FA

Division Artilleries

COL Russell, James W.
CSM Brennan, Paul M.
26th IN Div Arty
LTC Wright, Clarence A.
CSM Charbonneau, Edward G.
1st Bn, 86th FA
LTC Russell, Edward H.
CSM Beirne, John E.
1st Bn, 101st FA
LTC Huggins, Cleveland P., III
CSM Tassone, Vincent
2d Bn, 192d FA
LTC Dwyer, Edward S.
CSM Barboza, Frank, Jr.
1st Bn, 211th FA
COL Babb, Heinrich N.
CSM Sheard, James J., Jr.
28th IN Div Arty
LTC Zak, Leo P.
MSG Honkus, Thomas D.
1st Bn, 107th FA
LTC McClintock, Charles F.
CSM Stover, Charles V., Jr.
1st Bn, 108th FA
MAJ Ormando, John J.
MSG Taylor, John F., Jr.
(Acting)
1st Bn, 109th FA
LTC Messina, Michael R.
CSM Houston, David J.
1st Bn, 229th FA
COL Tyler, Terry J.
CSM Eldredge, Robert A.
29th IN Div Arty
LTC Rodier, Edward A., Jr.
CSM Perando, Scott A.
2d Bn, 110th FA
LTC Broome, Cecil A., Jr.
CSM Yeager, Thomas E.
2d Bn, 111th FA
LTC Fowle, William H.
CSM Ferguson, Lowell T.
1st Bn, 246th FA
COL Tincher, Ronald D.
CSM Williams, Robert B.
35th IN Div Arty
LTC Vonderschmidt, William W.
CSM Gorman, Gerald F.
1st Bn, 127th FA
LTC Winter, Brian D.
CSM Rudder, John L.
2d Bn, 130th FA
LTC Green, Roger C.
CSM Mortimer, James, III
2d Bn, 138th FA
LTC Frederiksen, Michael A.
SGM Stevens, George E.
1st Bn, 161st FA
LTC Winchell, Ronald E.
CSM Notman, Harold O.
1st Bn, 168th FA
LTC(P) Henry, Ronald W.
CSM Osborne, John D.
38th IN Div Arty
LTC Caie, James P., Jr.
CSM Pennell, Wayne G.
1st Bn, 119th FA
LTC James, Michael A.
CSM Wheeler, Robert B.
3d Bn, 139th FA
LTC Peterman, Roger D.
SGM Scott, Ronald K.
2d Bn, 150th FA
LTC Green, Frank B.
CSM Mattingly, James R.
1st Bn, 163d FA
LTC(P) Schmidt, Eugene W.
CSM Marschall, Josef O.
40th IN Div Arty
MAJ Morey, John E. *(Acting)*
CSM McGill, Bernis E.
1st Bn, 143d FA
MAJ Ramsey, Edwin P.
CSM Fine, Neal L.
1st Bn, 144th FA
LTC Kelley, William J., Jr.
CSM Morrison, Michael L.
2d Bn, 144th FA
LTC Watkins, Otis W.
CSM Andrews, Gary W.
3d Bn, 144th FA
COL Coggins, Norbert J.
CSM Eck, George E.
42d IN Div Arty
LTC Alesia, Pasquale A.
CSM Smith, Walter, Jr.
2d Bn, 104th FA
MAJ(P) Smith, Clifford A.
CSM Murfitt, Arthur M.
1st Bn, 187th FA
LTC Lundell, Carl
CSM Santovito, Ronald J.
1st Bn, 209th FA
LTC Constock, Richard H., Jr.
CSM *Vacant*
1st Bn, 258th FA
COL Hovda, Clayton A.
CSM Benda, Charles J.
47th IN Div Arty
LTC Perry, James F., Jr.
CSM Foley, Larry D.
2d Bn, 123d FA
LTC Rahkola, William A. R.
SGM Anderson, Jerome H.
1st Bn, 151st FA
LTC Bode, Robert L.
CSM Hodge, Harold L.
1st Bn, 175th FA
MAJ(P) Niles, Dennis D.
CSM Peterson, Leslie D.
1st Bn, 194th FA
COL Harvie, James C.
CSM Tolbert, Jerry E.
49th AR Div Arty
LTC Kreger, John W.
SGM Reese, John O.
2d Bn, 131st FA
LTC Powers, Christopher J.
CSM Black, Clyde D.
3d Bn, 132d FA
LTC Ingle, Thomas D.
CSM Shamy, Robert G.
3d Bn, 133d FA
LTC Lippke, Lawrence A.
CSM Belyeu, L. Wayne
4th Bn, 133d FA
COL Blysak, George J.
CSM Wagner, Roy R.
50th AR Div Arty
LTC Ford, John H.
CSM Mencer, Adrian L.
1st Bn, 112th FA
LTC Apgar, William I.
CSM Newman, Frank T., Jr.
3d Bn, 112th FA
LTC Devlin, Thomas J.
CSM Chiacchio, Charles G.
4th Bn, 112th FA
LTC Hafner, John F.
CSM Bennett, Joseph S.
1st Bn, 133d FA

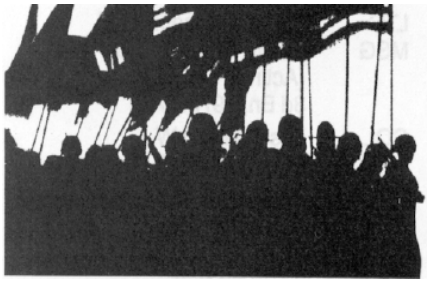
Brigades

COL Martin, Paul D.
CSM Clinton, Don
45th FA Bde
LTC Frazier, Charles J.
CSM Spruill, James D.
1st Bn, 158th FA
LTC Thompson, Bobby D.
CSM Ahrens, Lewis E.
1st Bn, 171st FA
LTC Bray, Kenneth W.
CSM Owens, Walter J.
1st Bn, 189th FA
COL Holmes, James W.
CSM Koehler, Lowell M.
57th FA Bde

LTC Strawn, Marvin I.
CSM Paul, James L., Jr.
1st Bn, 121st FA
LTC Lalim, Lyle D.
SGM Zins, Howard A.
1st Bn, 125th FA
LTC Thompson, David F.
CSM Villnow, William W.
1st Bn, 126th FA
LTC(P) Kanaczet, Richard P.
CSM Cerroni, Robert A.
103d FA Bde
LTC Charette, Norbert G.
CSM Iannelli, Paul A.
1st Bn, 103d FA
LTC Goddard, Joseph E.
CSM Wagner, Gerard J.
2d Bn, 103d FA
COL Lindsay, Roscoe, Jr.
CSM Hoover, Harold W.
113th FA Bde
LTC Taylor, Robert E.
CSM Barger, Raymond C.
4th Bn, 113th FA
LTC Midyette, Jack B.
CSM Pulley, Robert E.
5th Bn, 113th FA
COL Humberson, Sidney A.
CSM Daniels, Ralph C.
115th FA Bde
LTC Sharp, Robert C.
CSM Cash, Jack H.
1st Bn, 49th FA
LTC Lowham, James R.
CSM Persson, Kenneth A.
3d Bn, 49th FA
COL Pearce, Cecil L.
CSM Harville, Rodney J.
118th FA Bde
LTC Lunsford, James N.
CSM Youngblood, Enoch J.
2d Bn, 117th FA
LTC Tinley, Henry E.
CSM Nicora, Barry D.
1st Bn, 214th FA
LTC Rushing, Paul L.
CSM Tant, Kenneth W.
2d Bn, 214th FA
COL Hoppes, Ronald A.
CSM Blair, Charles M.
135th FA Bde
LTC Grantham, Everett C.
CSM Heinzler, James J.
1st Bn, 128th FA
LTC Gottschalk, Dempsey D.
CSM Dew, Larry E.
1st Bn, 129th FA
COL Ice, Thomas R.
CSM *Vacant*
138th FA Bde
LTC Gantt, Michael F.
CSM Price, Eugene L.
1st Bn, 623d FA
COL Armistead, Bobby H.
CSM Fondren, Bobby D.
142d FA Bde
LTC Meeks, Gary W.
CSM McCutchen, Wendell L.
1st Bn, 142d FA
LTC Horne, Nathan N.
SGM Fagala, Robin F.
2d Bn, 142d FA
COL Edwards, Ernest T.
CSM Bjerk, Orlo R.
147th FA Bde
MAJ(P) Goldhorn, Donald J.
CSM List, Donavon J.
1st Bn, 147th FA
LTC Whipple, Frank W.
CSM Logan, Richard L.
2d Bn, 147th FA
COL Boone, Claude W.
CSM Floyd, Hinson L.
151st FA Bde
MAJ(P) Demby, Robert E.
CSM King, Dewey L.
3d Bn, 178th FA
LTC Sipe, Nicholas P.
CSM Weaver, Vince C.
4th Bn, 178th FA
COL Pilcher, David H.
CSM Wright, Gerald A.
153d FA Bde
LTC Gordon, Jay P.
CSM Lara, Ysabel S.
1st Bn, 180th FA
MAJ(P) Perrin, Jack W.
SGM Smith, Lawrence W.
2d Bn, 180th FA
COL Suhre, William R.
CSM Haptonstall, Emmett L.
169th FA Bde
LTC Crowder, Ronald G.
CSM Curtis, James M.
1st Bn, 157th FA
LTC Stecklein, Ronald C.
CSM Long, Donald C.
2d Bn, 157th FA
COL Wynne, Marion K.
CSM Davis, Bobby G.
196th FA Bde
LTC Pack, James F.
CSM Pratt, John F.
1st Bn, 115th FA
LTC Rose, Jackie T.
CSM Murphy, Arthur L.
1st Bn, 181st FA
COL Couture, Roland W.
CSM Follensbee, David W.
197th FA Bde
LTC Hennessey, Charles K.
CSM Rice, Michael F.
1st Bn, 172d FA
MAJ Cassady, Michael L.
SGM Hammel, Leonard D., Jr.
2d Bn, 197th FA
LTC LeClerc, Joseph G. E.
MSG Scully, Edward L., Jr.
(Acting)
3d Bn, 197th FA
COL Losel, Glenn W.
CSM Flye, Jerome E.
209th FA Bde
COL Campbell, James F., Jr.
CSM Van-Kessel, George E.
227th FA Bde
LTC Neff, Jerry L.
CSM Rushing, William E.
1st Bn, 116th FA
MAJ(P) Bellar, James S.
CSM Carter, Harry T.
3d Bn, 116th FA
LTC Agosto, Antonio R.
CSM Rodriguez, Raul
1st Bn, 162d FA
COL Hester, Sidney E.
CSM Jones, Jerry A.
631st FA Bde
LTC Hyneman, John M.
CSM Cummins, Ancle W.
1st Bn, 114th FA
LTC Freeman, William R.
MSG Cooley, Donald L.
4th Bn, 114th FA

Separate Battalions

LTC Perry, William T.
CSM Wood, Kenneth E.
1st Bn, 111th FA
LTC Dowles, Bobby R.
CSM Eddins, William H.
1st Bn, 113th FA
LTC Richards, Harvey W.
CSM McBryde, Andrew P.
2d Bn, 114th FA
LTC Hawkins, Donald F.
CSM Jones, Robert R.
3d Bn, 115th FA
LTC Jones, Larry W.
CSM Poterfield, Robert W.
2d Bn, 116th FA
LTC Arabian, Gordon L., Jr.
CSM Keeney, John D.
1st Bn, 117th FA
LTC Logsdon, Harold K.
CSM Snyder, Tugh K.
3d Bn, 117th FA
LTC Kester, Thomas J.
CSM Diedrich, Mathew G.
1st Bn, 120th FA
LTC Cichanski, James B.
CSM Martin, Frank B., Jr.
2d Bn, 122d FA
LTC Higgins, John W.
CSM Woody, Joseph E.
1st Bn, 136th FA
LTC Waller, Ronald A., Jr.
CSM Leonick, Gerald A.
1st Bn, 141st FA



LTC	Read, Richard D.
CSM	White, William T. 2d Bn, 146th FA
MAJ	Bernard, Reginald
CSM	Martin, Roland 1st Bn, 152d FA
MAJ	Hall, Charles H., III
CSM	Sciortino, Salvatore J. 1st Bn, 156th FA
LTC	Davis, Jerry G.
CSM	Ashcraft, Merritt E. 1st Bn, 160th FA
LTC	Ruiz, Ricardo
CSM	Reyes, Ruven 2d Bn, 162d FA
LTC	Geddings, Friendly B.
CSM	Stevens, Larry D. 1st Bn, 178th FA
LTC	Holden, George, Jr.
CSM	Peska, Gerald M. 1st Bn, 182d FA
LTC	Roleff, Edmund F.
CSM	Harman, John E. 1st Bn, 201st FA
LTC	Williams, Anderson H., III
CSM	Busby, James C. 5th Bn, 206th FA
LTC	Hawkins, David S.
CSM	Tagwerker, John K. 2d Bn, 218th FA
LTC	Dewitt, Wiley M., Jr.
CSM	Glisson, Aaron 1st Bn, 230th FA
LTC	Kaneshi, Emerick Y.
CSM	Reis, James 1st Bn, 487th FA

Army Reserve

Brigades

COL	Wetterstroem, Robert S.
CSM	Papp, Emery J. 428th FA Bde
LTC	Noirot, George V.
CSM	Gregson, Joseph W. 4th Bn, 20th FA
MAJ	Inman, William T. (Acting)
MSG	Burmeister, Roy F. (Acting) 4th Bn, 38th FA
LTC	Kuruzar, Michael E.
CSM	Edmonds, Ollard D. 4th Bn, 333d FA
COL	Grunewald, Robert E.
CSM	Rogers, William T. 434th FA Bde
MAJ	McDermott, William J.
CSM	McRae, Roy T. 7th Bn, 1st FA
MAJ	Kauzlarich, Daniel L.
SGM	Saurez, Frank R. 4th Bn, 75th FA
LTC(P)	Bentsen, Gary M.
CSM	Mosier, James A. 479th FA Bde
LTC	Mineweaser, Clarence E.
MSG	Cavanagh, Charles D. *(Acting)* 4th Bn, 8th FA
LTC	Whitten, Thomas C.
CSM	Dailey, Robert T. 4th Bn, 92d FA

Separate Battalions

LTC	Colt, Richard S.
MSG	Mari, Daniel J. (Acting) 5th Bn, 5th FA
MAJ(P)	Read, George W.
CSM	Walker, William L. 7th Bn, 9th FA
LTC	Ruchti, Larry D.
MSG	Pearson, Andrew L. (Acting) 3d Bn, 14th FA
MAJ	White, Ray A.
CSM	McCain, Gilford L. 3d Bn, 15th FA
LTC	Roney, Benjamin E., Jr.
CSM	Comme, William E. 4th Bn, 17th FA
MAJ	Hyle, Francis M.
CSM	McKinney, John V. 5th BN, 28th FA
MAJ	Gaffney, John
SGM	Wiede, Gerd 3d Bn, 42d FA
LTC	Carson, Chester P., Jr.
MSG	Lenox, Chester A. (Acting) 3d Bn, 75th FA
LTC	Thompson, Charles L.
SGM	Kirk, William J. 3d Bn, 83d FA
MAJ(P)	Robinson, Burt T.
CSM	Epps, Richard N. 6th Bn, 83d FA
MAJ	Shinn, Ronald W.
CSM	Furcolow, David L. 3d Bn, 92d FA

US Marines

Col	Roberts, T. W.
SgtMaj	Cromwell, L. R. 10th Marines
LtCol	Spain, W. R.
1stSgt	Birdsell, G. F. 1st Bn, 10th Mar
LtCol	Morgan, T. C.
SgtMaj	Stukes, G. L. 2nd Bn, 10th Mar
LtCol	Campbell, E. M.
SgtMaj	Grady, I. O. 3rd Bn, 10th Mar
LtCol	Wagner, J. H.
SgtMaj	Wilson, A. S. 4th Bn, 10th Mar
LtCol	Milo, B. C.
SgtMaj	Hatcher, W. E. 5th Bn, 10th Mar
Col	Pipta, J.
SgtMaj	Cobb, R. 11th Marines
LtCol	Rogers, S. G.
SgtMaj	Cunningham, T. A. 1st Bn, 11th Mar
LtCol	Kotora, J. C.
SgtMaj	Smith, R. W. 2nd Bn, 11th Mar
LtCol	Polak, R. L.
SgtMaj	Tannish, W. 3rd Bn, 11th Mar
LtCol	Oates, W. D.
SgtMaj	Brumbalauw, R. R. 5th Bn, 11th Mar
Col	Brosnan, J. F., Jr.
SgtMaj	Mobilia, J. C. 12th Marines
LtCol	Morosoff, P. S.
SgtMaj	Williams, P. S. 1st Bn, 12th Mar
LtCol	Finnerty, T. P.
SgtMaj	Mills, J. H. 2nd Bn, 12th Mar
LtCol	Palermo, A. M.
SgtMaj	Avy, H. C. 3rd Bn, 12th Mar
LtCol	Garcia, D. O.
SgtMaj	Duran, S. 4th Bn, 12th Mar
Col	Ressmeyer, J. A. H.
SgtMaj	Alvarado, G. 14th Marines (Reserve)
LtCol	Klemmer, G. R.
SgtMaj	Robinson, H. A. 1st Bn, 14th Mar
LtCol	English, B. J.
SgtMaj	Rivera, U. 2nd Bn, 14th Mar
LtCol	Shimonis, P. J.
SgtMaj	Brooks, K. 3rd Bn, 14th Mar
LtCol	Hill, D. W.
SgtMaj	Dixon, B. J. 4th Bn, 14th Mar
LtCol	Yorck, D. C.
SgtMaj	Whitaker, J. H. 5th Bn, 14th Mar

Command Sergeant Major David P. Taylor, Fort Sill, Oklahoma

Education: One Key to NCO Development

Kevin Tucker

As a Command Sergeant Major, I can give a commander suggestions that will help keep him on the same "azimuth" as our boss.

As Command Sergeant Major of Field Artillery, what role do you play in setting Branch-wide policy for enlisted soldiers?

I don't actually set branch policy. But I have daily access to the people who do set those policies. With the feedback I get from soldiers in the field, I can influence policies to make better training programs and help the Field Artillery.

An article in the US Army War College quarterly magazine ***Parameters*** *["The Army's Command Sergeants Major Problem," June 1988] suggests that using senior command sergeants major as unit inspectors preempts the authority of subordinate unit commanders. How do you balance the requirement to get feedback from enlisted soldiers in the units with the rights of commissioned officers responsible for those units?*

First, let me clarify. At no time are command sergeants major in "command" of anything. That's a title; we work for the commanders. And it's not a "we-they" situation. We're not trying to preempt anything commanders do.

I hope a commander feels I'm an extra set of eyes, maybe with a little more experience than a junior commander may have, who can give him some suggestions that will help keep him on the same "azimuth" as our boss.

I spend probably 60 percent of my week going around and looking at units. When I go out to look at a unit, I don't change anything the commander is doing—I don't have the authority to do that. I might offer suggestions to improve things and leave them at that—suggestions. Usually, I don't deal with the subordinate commander directly but with his command sergeant major. I'm there to work with the commander, never against him.

What concerns do you hear from the field when you're gathering information?

The soldiers in the Field Artillery are like any other soldiers. They're concerned with promotions and education. With budget and force-structure constraints, we have a limit on how many soldiers per grade we can promote in

Kevin Tucker

Some soldiers wish they'd enrolled in the GI Bill when they first came in the Army because college becomes an important factor in their careers.

At the grade of E5—earlier if possible—you should start working toward a college degree.

each MOS. So, our promotions have slowed down and may stay that way for a short time. We then should see steady improvement.

As far as education is concerned, soldiers are eligible for the GI Bill but only if they sign up for it when they first come into the Army [1985 Montgomery GI Bill]. A soldier pays $100 a month for 12 months and gets back $300 in college assistance for 36 months, depending on whether he's a full or part-time student and a few other parameters. If he's a high school graduate or equivalent, enlists for a shortage MOS and meets other criteria, he's eligible for even more assistance [New Army College Fund].

But he only has the one chance up front to enroll in the GI Bill. Some young soldiers don't know what they want. They say, "I'm not going to college" and then later wish they'd enrolled in the GI Bill because college becomes an important factor in their careers.

Any soldier, whatever his field, is happy as long as he's doing something constructive. If he's training and learning and getting that pat on the back when he earns it, he's happy. Soldiers who gripe or have disciplinary problems are usually the ones we don't keep busy constructively. We give them make-do work just to keep them busy.

Overall, we do well in the Field Artillery keeping them busy constructively. Because of the nature of Field Artillery, we do a lot of training in many different locations. We're active and that's a plus for us. Soldiers like what they do. If you'll look, you'll see we do well in recruiting quality soldiers. That only happens if soldiers feel good about and like what they're doing.

What are some of the biggest challenges Field Artillery soldiers face?

One of the biggest challenges we face today is the modernization of our Army. We're bringing in new equipment—computers being a big part of that new equipment. Our young soldiers are well-educated. They were brought up in a computer world. But the "old" soldiers weren't. Our challenge is getting the older soldiers to learn to operate our new high-tech equipment, including computers, so they can train our young soldiers to use them. This will be a challenge for years to come because our equipment is going to continue to change and modernize.

For example, we may soon see the HIP howitzer in our artillery inventory [howitzer improvement program (HIP), semi-autonomous M109 howitzers]. With the HIP, a young NCO will have more responsibility than ever before. As the section chief, he may have to go out on a mission by himself in a HIP howitzer. He may have to make decisions that before were made by the principal players who were with him. We can't afford for his decisions to be wrong.

Another challenge we face is remembering the basics. Our senior NCOs must train soldiers on the constantly changing equipment but also train the basic skills and instill the discipline that prepare an army to go anywhere, fight, win and come home.

The Army consolidated all Field Artillery MOSs into CMF 13. What effect has this reconfiguration had on NCO professional development?

It hasn't changed NCO professional development. There was a misconception that by moving different MOSs under one field, it might affect the promotion system. However, it hasn't because we don't promote by career fields. We promote by MOS and the needs of the service.

For example, a qualified sergeant first class in a target acquisition MOS has an equal chance for promotion in his MOS as others in CMF 13 have in their MOSs. Budget restraints and the number of people we have in the Army by MOS, rank, etc., affect promotions. But that has nothing to do with a particular career field.

Promotions are strictly by MOS until the MOSs merge into one—at E8 you

become a 13Z. After 13Z, you become a command sergeant major (00Z), which is branch immaterial.

Usually the E8 and the E9, regardless of what MOS he comes out of, is familiar with the training of the other artillery MOSs. It's not as though he makes E8 and gets a job that he's unfamiliar with.

What effect is the new NCO-ER [NCO Evaluation Report] having on Field Artillery soldiers?

The NCO-ER is the best evaluation system I've seen in my 27 years in the military. The old system was a very inflated system. There was no way to discriminate between good soldiers and excellent ones. We gave them all max scores of 125 on the old EER [Enlisted Evaluation Report]. But now we can discriminate.

We don't evaluate soldiers by numbers anymore but rather by narrative. When you say a soldier's better than successful in any part of his performance, you must justify that in writing in a simple bullet format. For example, if you say a sergeant is excellent in physical training, you must back your rating up with a bullet proving it: "NCO teaches PT daily. Scored 300 on PT test." If you can't back it up, then you have to rate him only "successful." This separates the soldier who's excellent from the one that's just successful every day.

The NCO-ER went into effect last June, and it's vital Field Artillery raters, endorsers and reviewers fill them out correctly. The rater has to counsel the soldier every quarter to give him feedback on his performance. That lets the soldier know where he stands with his leaders. The counselling statement also backs up the rating on the NCO-ER.

The most recent E9 promotion list gives clear notice to Field Artillery NCOs that two years of college is becoming very important for promotion. What are your thoughts on what appears to be a requirement to balance a heavy on-duty workload with participation in off-duty educational programs?

Personally, I don't think two years of college ought to be a requirement for promotion to E9. But I understand why we need educated senior NCOs. We're in an age that requires computer, math and writing skills.

But an NCO usually isn't selected for promotion unless he has excellent potential. Some excellent NCOs haven't had the time or opportunity to work on college courses because of their job requirements or location. Though they're in the minority, that discriminator knocks them out of the "running" for promotion.

If a college degree is going to be the discriminator, then we should tell soldiers that early in their careers. That would give soldiers ample time to earn degrees as they progress through the ranks.

What advice would you give our ambitious, young NCOs who aspire to the most senior NCO positions?

If you want to succeed in your Army career, get your education early. At the grade of E5—earlier if possible—you should start working on college. Then by the time it's the deciding factor for promotion, all of it's behind you.

Another thing you can do is take care of your Department of the Army records. Keep them updated with all of the positive information you can. The contents of your records decide if and when you get promoted.

You also need to listen to your officers and NCOs and learn from their experience. Dedicate yourself to what you're doing, regardless of what it is. Set goals to work toward. If you don't learn and set goals, you'll never be as successful as the individual who does. If you're going to be a Field Artilleryman, be a good one.

The NCO-ER is the best evaluation system I've seen in my 27 years in the military.

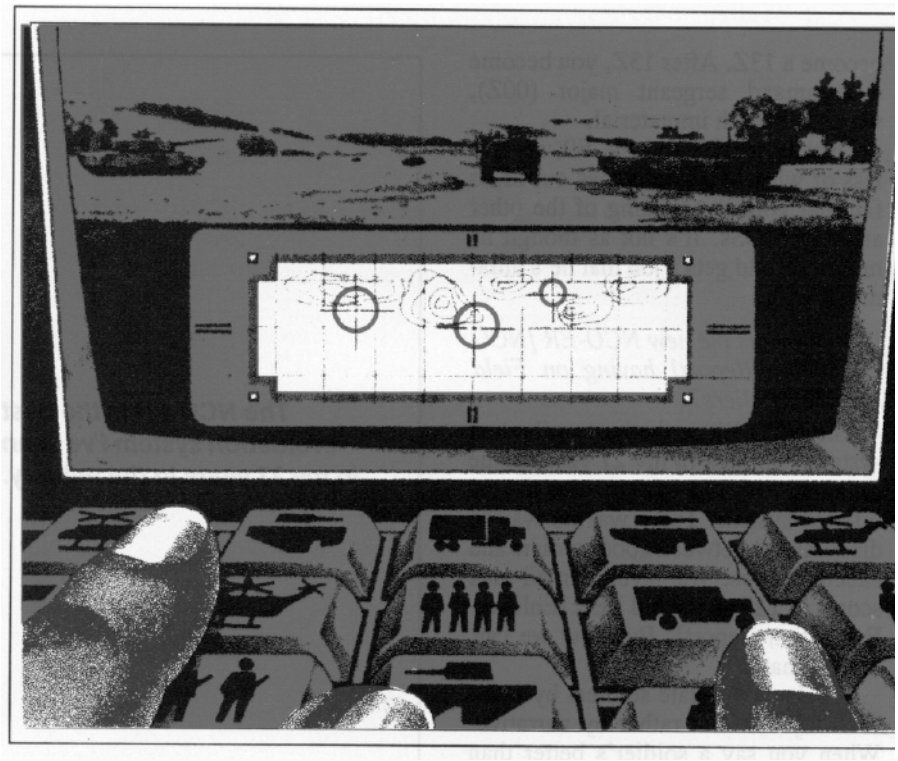
Kevin Tucker

Command Sergeant Major David P. Taylor became the senior NCO for the US Army Field Artillery Center and Fort Sill in December 1987. He's a graduate of the US Army Sergeants Major Academy, Fort Bliss, Texas; Fourth Army NCO Academy, Fort Sill; Seventh Army NCO Academy, West Germany; and the Advanced NCO Course, Fort Sill. Since coming into the Army in 1961, Command Sergeant Major Taylor has served in a variety of positions as a cannoneer, a battalion operations sergeant and Command Sergeant Major for a battalion and the Division Artillery in the 7th Infantry Division (Light), Fort Ord, California. He also was Command Sergeant Major for the 2d Infantry Division Artillery, Republic of Korea.

Innovative Fire Support Training —

The Time is Now!

by Colonel Josue Robles, Jr.



It seems only appropriate that during the Army's Year of Training, we in the fire support community step back and reassess our training for the traditional artillery mission: to provide timely and accurate fire support against a mobile enemy. Fire support training suffers from some endemic problems that inhibit our ability to provide the maneuver commander the synchronized and integrated fires essential to success on today's AirLand Battlefield. One only needs to observe a few "battles" at the National Training Center (NTC) at Fort Irwin, California; the Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas; or at the Combat Maneuver Training Center (CMTC) at Hohenfels, West Germany, to conclude the Army is not benefiting totally from the combat multiplier effect fire support can provide.

I'm not suggesting good, innovative fire support training isn't occurring in the field today. Nor am I suggesting we haven't done well in training our artillerists in days gone by. What I am suggesting is that the fluidity and the dynamics of the modern battlefield should cause us concern about our ability to accomplish our mission on the AirLand Battlefield.

This article outlines some training shortcomings and offers some ideas to train in a smarter and, in some cases, totally different way. The result should be better fire support for our maneuver forces.

Training Evaluation

After analyzing data on NTC rotations, data compiled by the Center for Army Lessons Learned (CALL) at Fort Leavenworth, Kansas, and discussions with the Field Artillery School, most of fire support's shortcomings are because of four key problems:

- Fires and maneuver aren't synchronized fully.
- Fires don't always support the maneuver commander's intent.
- Fires are generally ineffective due to poor target location, the difficulty of hitting a mobile enemy and not massing fires.
- Fire support coordination and integration are weak and fragmented.

To alleviate some of these problems, we devised a training improvement plan, created a fire support committee and outlined some home-station training issues.

Fire Support Improvement Plan

In response to these and other areas of concern, the Fire Support Element of the 1st Infantry Division (Mechanized), Fort Riley, Kansas, developed a Fire Support Improvement Plan (FSIP) to help guide the Division's actions in conducting its training. The FSIP is the vehicle by which we, in the fire support business, can assess fully our training deficiencies and develop a comprehensive training plan.

The plan uses a combination of training simulations, fire support training lanes, professional seminars, hands-on certification and command post and field training exercises to meet the Division Commander's goal: timely and accurate fires on a mobile enemy in support of the maneuver commander's intent. As a sub-goal, the FSIP calls for 75 percent effective fires as measured by the NTC's indirect fire casualty assessment system (IFCAS). With such

goals, we're realists and understand that to be most effective, fire supporters need the help, advice and consent of other members of the combined-arms team.

Division Fire Support Committee.

For many years the 1st Infantry Division has had armor and infantry committees. Their mission is to ensure integration, training standardization and policy formulation for efficient and effective armor and infantry training. Therefore, logically, a similar committee needs to oversee the more pervasive area of fire support training.

Chaired by the Assistant Division Commander (Maneuver) and presided over by the Division Artillery Commander, the Fire Support Committee meets quarterly. It has representatives of the major contributors to and users of fire support in the Division: maneuver and aviation brigade commanders and engineer, air defense artillery and the combat electronic warfare and intelligence (CEWI) battalion commanders, to name a few. The Fire Support Committee hammers out policies and procedures using the FSIP as the master plan. Together, the divisional combined-arms team works to improve the standing operating procedures (SOPs), tactics, techniques and procedures necessary to win on the battlefield.

Some Home Station Training Issues

Although the FSIP covers many facets of the fire support problem—institutional training, organizational and equipment issues and research and development issues—the Big Red One could most directly influence home-station training. We outlined some artillery training issues related to the fire support performance problems I've identified.

Train as a Team. Probably the single, biggest deficiency we can be accused of is the lack of time we devote to training with our combined-arms partners. We have all kinds of excuses for spending, on the average, so little time training in a combined-arms context—geographical, technical, and above all, some parochial excuses. We like to train in a "service practice" mode. We understand it and have always done it that way. But in this era of scarce resources, we must habitually train in a combined-arms mode if we hope to get better at fire support integration and synchronization. It's not always easy.

We can find the training time to improve our skills as artillerymen and mortarmen during crew drills or section-and platoon-level training. Battery-level and higher training should always include the maneuver units. We shouldn't fire a single artillery or mortar round that isn't supporting multiple people to get the maximum training value. Combined-arms training should be the norm, not the exception.

The caution is that this approach requires detailed, continual planning and coordination. The Fire Support Committee and quarterly training briefs help us immensely with planning and coordination.

Train to Engage a Mobile Enemy. Anyone who has trained at one of our combat training centers knows how difficult it is to suppress, neutralize or destroy a moving enemy. I'm not suggesting we try to hit moving Soviet T-72 tanks or BMPs, (tracked infantry combat vehicles). But we must be able to suppress, neutralize or destroy (if the maneuver commander so chooses) a column or tactical formation in our fire sack or one that threatens friendly forces.

At home station, we tend to practice suppressing or neutralizing stationary targets only, shooting at car bodies on the sides of hills. We haven't come to grips with the necessity to train to hit a moving enemy. We desperately need a moving target range at home station patterned after the multipurpose range complexes (MPRC) currently used for tank and mechanized infantry gunnery.

Train Observers to Shoot While on the Move. A corollary issue to being able to engage a moving enemy is our fire support team's (FIST) and other fire supporters' abilities to bring effective fire to bear on the enemy while we're moving. Compounding the problem is the fact that many of our fire support officers "hitchhike" with the maneuver commanders, riding in cramped quarters with little visibility of the battlefield. Our FIST personnel, on the other hand, often bump along in an M113 fire support or Bradley vehicle in tactical formation, in the dust and smoke, trying to orient themselves and their supported commander.

1st Infantry Division Artillery Home-Station Training Issues

- Train as an integrated team.
- Train to engage a mobile enemy.
- Train observers to shoot while on the move.
- Use a top-down instead of a bottom-up approach to fire planning.
- Locate the DS artillery battalion commander and task-force fire support officers forward with the maneuver commander.
- Improve land-navigation and map-reading skills.

Institutionally, we don't train our fire support personnel to adjust fire while on the move. Instead, we practice World War II-era techniques and train to adjust fire from a stationary position. The implications are clear.

It's incumbent upon the fire support community to train at home station to engage the enemy while we're moving in the heat of battle. A mobile observer course linked to a moving target training lane appears to be one solution to this dilemma.

Top-Down Versus Bottom-Up Fire Planning. Traditionally, fire planning has emphasized a bottom-up planning approach, starting with the forward observer or FIST personnel and working up to the task force and brigade fire support officers (FSOs). It seems illogical that, given the current doctrinal approach to fighting battles at the brigade level, we would continue this inefficient planning process.

First, the forward observer or FIST personnel are usually the least experienced members of the fire support chain. We ask our most inexperienced fire supporters to do the toughest job, requiring the most experience and judgment. This mission is logically better suited for the brigade or task force FSO.

Second, the current intelligence preparation of the battlefield (IPB) process is focused at the brigade level, as opposed to the company or platoon level. Since the IPB process is key to successful fire plan development, it only makes sense to build the fire plan at the brigade level where the key IPB resources and information are.

The third point is the brigade commander has only a limited amount of fire support resources to apply to the fight. Allocation decisions need to be

made at the brigade level. Allocations of targets, family of scatterable mines (FASCAM) fields, minutes of smoke, close air support (CAS) sorties and the like need to be made by the brigade commander and transmitted to subordinate units via the top-down fire plan.

Thereafter, the task-force and company-team levels refine the top-down fire plan, adjust aimpoints, identify duplications and add company-level targets. The process is completed as the fire plan works its way back to the brigade level with company and task-force fire support personnel reviewing it along the way. Obviously, if the fight is being orchestrated at the task-force level, then the same procedures apply at the lower level.

In the Big Red One, the brigade top-down fire plan is limited to about 60 targets for each brigade. This is about the right number of targets for a direct support (DS) battalion and one reinforcing artillery battalion to support in the brigade battle adequately, meeting gunnery constraints and getting the desired effects on the targets. But each unit must determine its optimum number of targets, based on mission, enemy, terrain, troops and time available (METT-T).

In addition, we established a cutoff time after which we wouldn't change the fire plan without the task-force or brigade commander's concurrence. This is necessary to discipline the system and have the fire plan ready for execution when the battle begins. Finally, we transmitted the top-down fire plan to subordinate units via a fire support execution matrix (see Figure 1).

FIGURE 1: Sample Brigade Fire Support Execution Matrix

***FIRE SUPPORT* TF 1-23 DAY DEFENSE**

1. Commander's Intent for Fire Support:

1. SUPPRESSION AND JAAT WEST OF LEACH LAKE PASSES
2. MASS FIRES AND JAAT EAST OF LEACH LAKE PASSES
3. MASS FIRES VIC TGT AC0010 TO FORCE THE ENEMY NORTH INTO TF 1-23 AREA
4. MASS FIRES TO SUPPORT BP 42

2. FIRE SUPPORT MATRIX.

		DECISION POINTS PL MACE	PL BOW	PL ARROW		
TF 4-56		AC 0008	AC 0013 AC 0009		
TF 1-6					
TF 1-23			AC 0012 AC 0010		
3 BDE		TGT AC0010 GROUP A3C GROUP A1C TF 4-56 OBS			
FPF PRI TGTS		3 PRI TGT BDE	2 FPF > 1-23 1 P TGT > 1-23 1 P TGT > BDE		
PRIORITY OF FIRES	TF 1-23	TF 1-23	TF 1-23		
CFL		PL BOW (3 BDE)	PL ARROW (3 BDE)		

☐ Suppress ☐ Neutralize ☐ Destroy

3. COORDINATING INSTRUCTIONS:

a. The current brigade CFL is NONE _____, eff _____, on-order PL BOW _____, on-order PL ARROW _____, on-order _____.
b. Voice calls for fire 4-2FA CF2 (SECURE) freq _____ call sign _____.
c. TF 4-56 HAS RESPONSIBILITY FOR BDE TARGETS FROM PL BOW TO PL ARROW.
d. MOVEMENT OF DECISION POINT WHEN 1ST ECH. BN. REACHES THE PL.
e. INITIAL BDE FASCAM TRIGGER POINTS WHEN 1ST ECHELON BNS REACH
AC 0050 NAI VIC 2237 AC 0052 NAI VIC 2838
AC 0051 NAI VIC 2835

4. CRITICAL INFORMATION:

FA ORGANIZATION 1/2 FA(155) DS 3 BDE 1/B/6 FA(MLRS) GS 52 ID	CDR'S ATTACK CRITERIA NEUT ADA SUPP AR PLT & LARGER
# BN 3'S HE TOTAL = 11 TF 1-23 IN (6) TF 4-56 IN (2) BDE (3)	# OF FASCAM 5 MED DENSITY AVAILABLE TF 1-23 (2) BDE WILL RELEASE CONTROL TF 4-56 (0) OF MINEFIELD UPON RECEIPT BDE (3) OF INTENTION REPORT
MINUTES OF SMOKE/ILLUM TF 1-23 10 MIN IS/7 MIN QS/15 ILL TF 4-56 5 MIN IS/3 MIN QS/9 ILL	TARGET AREA SURVEY PRIORITY TO TF 1-23
ALLOCATION OF CAS PLANNING AIRCRAFT CAS REQUEST TO BDE (6) A-10 BDE NLT 1600 1-23 (6) F-16 DAILY 4-56 (2)	JAAT PLAN 3 JAAT MSN WEST OF LEACH LAKE-3BDE PL BOW to PL ARROW-3BDE PL ARROW TO PL SPEAR-TF 1-23

ACA ALLOCATION
3BDE 30-33, TF1-23 34-37, TF4-56 38-41, TF1-6 42-45

ACA 30
PT 1 282254
PT 2 313306
PT 3 267365
PT 4 217275
MIN ALT 0 METERS
MAX ALT 9999 METERS
EFF DTG _____ ON ORDER _____

ACA 31
PT 1 299281
PT 2 487171

WIDTH 3000 METERS
MIN ALT 0 METERS
MAX ALT 9999 METERS
EFF DTG _____ ON ORDER _____

ACA 32
PT 1 530300
PT 2 440300
PT 3 440230
PT 4 303280
PT 5 303350
PT 6 530350
MIN ALT 0 METERS
MAX ALT 9999 METERS
EFF DTG _____ ON ORDER _____

ACA 33
PT 1 330333
PT 2 392318
PT 3 356222
PT 4 276251

MIN ALT 0 METERS
METERS MAX ALT 9999 METERS

EFF DTG _____ ON ORDER _____

ACA 41 3BDE SECTOR

5. SPECIAL INSTRUCTIONS:

a. 1-2FA (155mm) DS 3d Bde
b. CSR HE/24 WP/1 ILL/2 HC/1 RAAMS/14 ADAM/4

Locate the DS Artillery Battalion Commander and Task-Force FSO Forward with the Maneuver Commanders. There is *no* substitute for having the fire support principal, from company through division level, forward with his supported maneuver commander. Although a task-force FSO or DS artillery battalion commander who is "wearing his brigade fire support coordinator (FSCOORD) hat" can be valuable in the maneuver tactical operations center (TOC), his close proximity to his supported maneuver commander is critical.

There are many good arguments for the task-force FSO to be at the maneuver TOC. But it's more important he be forward with his supported commander to advise him on fire support. The same is true of the DS artillery battalion commander with respect to his responsibilities as a commander versus his role as a fire support coordinator. The point is we must position ourselves on the battlefield where we best influence the outcome of the battle.

We all have competent battalion executive officers and S3s who can do the job in our absence. The maneuver

forces have embraced this second-in-command concept totally. We're still a bit reluctant.

Improve Land Navigation and Map Reading Skills. Sadly, the NTC as well as many other training environments demonstrate only too clearly many fire supporters' shortcomings in map reading and land navigation. We seem to be tied to old methods to train our people in land navigation. Some of these methods are good, but in many cases, they don't train our soldiers effectively to navigate in the complex environment of the modern battlefield.

We don't ride around in jeeps as often on the modern battlefield. Instead, we bump along in M-1 tanks or Bradleys that go much faster than we're used to. Additionally, smoke, fog and darkness hamper our ability to know exactly where we are on the battlefield, so we often have difficulty bringing effective fires to bear on the enemy.

The solution is clear. We must supplement current map reading and land navigation training with more training in resection, terrain recognition and mounted land navigation. The training set fire observation (TSFO) and a low-cost, mounted land navigation course are ideally suited for these purposes.

Some Home-Station Training Solutions

After developing the FSIP and outlining training issues, we designed home-station training to address those issues and alleviate some of our endemic fire support problems. The Big Red One found the following programs particularly effective solutions.

TSFO

The TSFO is a multipurpose training device we can use for more than just training observers to adjust mortar and artillery fire properly. Because it's computer driven, you can program it to train soldiers in a variety of environments with many scenarios.

To program this variety, the up-front investment is principally a little time to get terrain photographs to match either your deployment area or training environment. The Fire Support and Combined Arms Operations Department at the Field Artillery School at Fort Sill can help you with photographs. Units call the TSFO Branch at AUTOVON 639-3085 or Commercial (405) 351-3085 or 3888. You also need to invest some money to install radio mounts, junction boxes, combat vehicle crewman (CVC) helmets and the like to replicate your battlefield environment. Finally, you need to ask your maneuver counterparts for help in writing the scenarios and operations plans and constructing training lane to replicate the battle in the TSFO.

Once you've assembled the equipment and training aids, you then can begin seriously to train maneuver company commanders, platoon leaders, fire support officers, FISTs, air liaison officers (ALOs), mortar platoon leaders, engineers, air defense artillery personnel, etc—in effect, the entire combined-arms team—to integrate fire and maneuver and engage moving targets. The possibilities are unlimited. As you get more sophisticated in your training, you can link the TSFO to TOCs, to the tactical fire direction system (TACFIRE), to the howitzers, to division artillery and Field Artillery brigade headquarters, and so forth.

The TSFO allows you to work out your tactics, techniques and procedures and refine SOPs in a very low-cost environment before going to the field and expending scarce training resources. For the fire support community, the TSFO provides integrated training, teaches us to engage a moving enemy and fosters team building at the combined-arms level. Our training at the TSFO before our Division's NTC rotations was key to the successful outcomes on the valley floor during "the battles."

Finally, you can use the TSFO to train terrain familiarization and land navigation techniques as well as practice joint air attack team (JAAT) operations before going on a live-fire exercise. Try it, you'll like it!

ARTBASS and First Battle Computer Simulations

The Army training battle simulation system (ARTBASS) computer simulation and the First Battle computer simulation are excellent tools for fire support sustainment training. The ARTBASS is the preferable of the two because it allows you to train an entire task-force slice. It also more closely replicates the volume and intensity of a task-force battle. You need to adjust the ARTBASS software to modernize the fire support equipment in the simulation so it is compatible with the equipment in the field today.

At a lower level of intensity is First Battle. It's limited in both software and hardware to be a truly effective tool for combined-arms and fire-support sustainment training.

These computer simulations are the best available in the field today, so you need to be creative in weaving them into unit training programs. We used these simulations in monthly fire support sustainment training at the division artillery level. We use them in command-post exercises, training everyone from individual task force FSOs to the brigade level. Like the TSFO, only our imagination limits the complexity of the training.

Mobile Observer Course

We err by not training our young observers and FIST personnel to shoot on the move. A mobile observer course corrects this deficiency. A simple course that generally runs along the periphery of an artillery impact area is quite suitable.

You should have dry-fire as well as live-fire courses. For the dry-fire version, you first train them to adjust fire on a stationary target. Then they graduate to adjusting fire on a moving target, ultimately, at the same time they're moving in their M113s or Bradleys. A position and azimuth determining system (PADS) jeep is an excellent target since the observer-controller can compare the data computed by the forward observer to actual data off the PADS

Fire Support Training Guide

Redlegs from the 1st Infantry Division Artillery published a "Fire Support Training Guide," which outlines innovative fire support training ideas. It discusses ways to improve fire support operations and offers solutions to personnel and equipment resource problems. The Guide also describes home-station training lanes that require few resources, but afford outstanding simulated combat training.

Units can request copies of the Guide by writing:

Commander
1st Infantry Division (Mechanized) Artillery
ATTN: FSE
Fort Riley, Kansas 66442

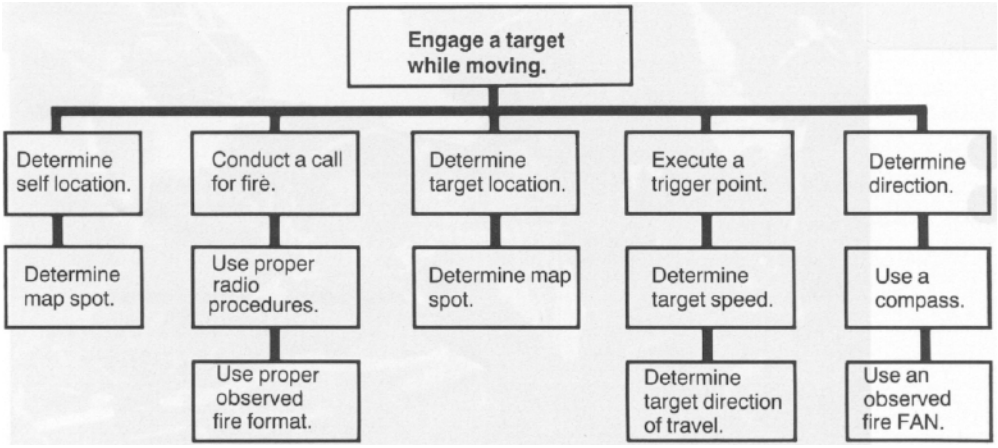


Figure 2: Hierarchy of Tasks for the Mobile Observer Course

computer at the time of "shot." (See Figure 2, Hierarchy of Tasks for the Mobile Observer Course.)

Once they master the dry-fire training lane, they can graduate to a live-ordnance training lane. This approach is relatively low-cost and is quite effective at training observers to shoot while on the move.

Moving Target Lane

Because Fort Riley doesn't have a moving target range for artillery and mortars, we designed a moving target training lane as an adjunct to the mobile observer course. Again, you can use a PADS jeep to practice engaging a moving vehicle traveling along a predetermined course at a speed replicating the movement of an enemy formation. The observer calculates his trigger points and practices hitting the moving jeep using a standard mission processing time and time of flight. You then compare the data between the observer's grid and the grid the PADS jeep computed five seconds after "splash." As with the mobile observer course, the training has tasks, conditions and standards.

This training, in conjunction with our TSFO training, greatly improved our proficiency at the NTC. (See Figure 3, Hierarchy of Tasks for the Moving Target Lane.)

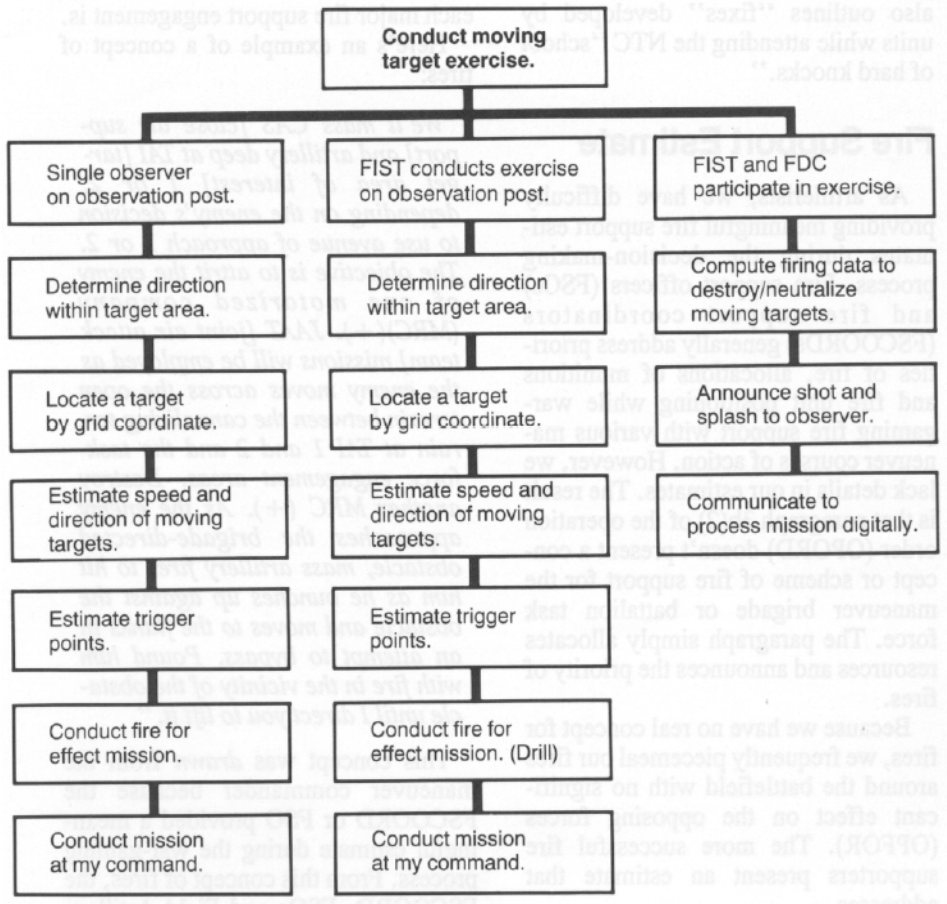


Figure 3: Hierarchy of Tasks for Moving Target Lane

Conclusion

In many respects, fire support training hasn't prepared us for the realities and complexities of the modern Air-Land Battlefield. The fast-moving, complex operations we experience at our combat training centers have brought this point home vividly.

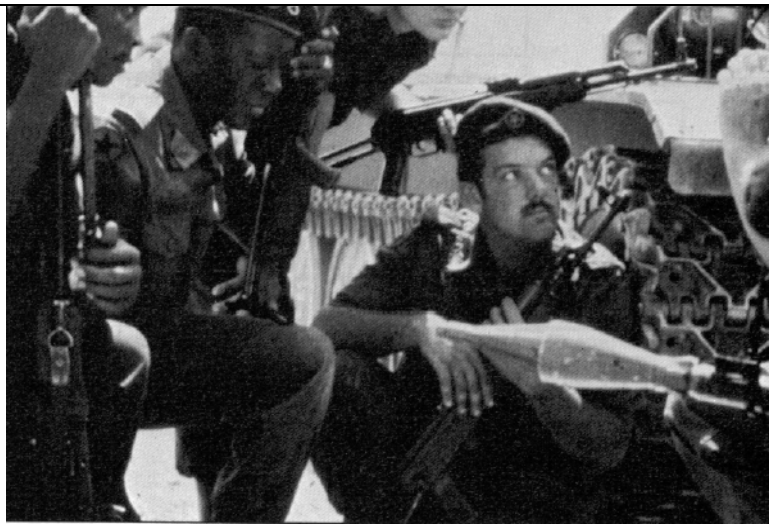
We still train fire supporters much the way we did 25 years ago. This situation must change if we're to shoulder fully our responsibilities as equal partners on the combined-arms team.

I've addressed briefly a few Big Red One training initiatives to improve its ability to integrate and synchronize fire and maneuver. There are many other training innovations in the field. I challenge all Redlegs to share these ideas with others to improve our profession. We must give our maneuver forces the fire support they deserve.

Colonel (P) Josue Robles, Jr., commanded the 1st Infantry Division (Mechanized) Artillery, Fort Riley, Kansas, from 1986 until his recent reassignment in July as Army Planner (Joint Affairs) Office of the Deputy Chief of Staff for Plans and Operations, Washington, D.C. He is currently the Director of Operations and Support, Office of the Comptroller of the Army, also in Washington, D.C. He commanded the 1st Battalion, 7th Field Artillery (155-mm self-propelled), Fort Riley; C Battery, 2d Battalion, 8th Field Artillery (105-mm towed), 7th Infantry Division, Republic of Korea; C Battery and Headquarters and Headquarters Battery, 1st Battalion, 30th Field Artillery (155-mm towed), 1st Cavalry Division, Vietnam; and Headquarters and Headquarters Battery, 42d Artillery Group, V Corps Artillery, West Germany. Colonel Robles has commanded units for more than seven years.

NTC:

Fire Support Trends and Fixes



by Lieutenant Colonel William R. Brown

Fire support's performance from the line of metal to the Field Artillery battalion field trains has greatly improved during National Training Center (NTC) rotations at Fort Irwin, California. The NTC subjects Field Artillery battalions to stressful conditions. Units operate in a chemical environment in force-on-force and live-fire training. Batteries operate in mission-oriented protection posture, level-four (MOPP IV) gear at temperatures well above 100 degrees.

Units evacuate notional casualties, repair equipment and reconstitute during and after each battle. Batteries emphasize digging soldier fighting positions with 18 inches of overhead cover. Field Artillery battalions employ combat trains and field trains and work closely with the brigade support area to get supplies and services. Units routinely conduct sustained combat service support operations over realistic distances. Through it all, firing batteries are proving to be more agile in moving about the battlefield.

Fire support's performance forward of the line of metal has improved some. However, many of the shortcomings observed in 1982 through 1984 are still valid today. And we must perform this part well, or all else will be ineffective. Having all 18 howitzers operational, current muzzle velocities, accurate meteorological data, batteries and platoons on a common direction and splendidly trained fire direction centers (FDCs) is to no avail if target locations are inaccurate and fires aren't integrated responsively with maneuver. Since the highest payoff to increase our effectiveness is at the leading edge of fire support, this article discusses trends forward of the line of metal. It also outlines "fixes" developed by units while attending the NTC "school of hard knocks."

Fire Support Estimate

As artillerists, we have difficulty providing meaningful fire support estimates during the decision-making process. Fire support officers (FSOs) and fire support coordinators (FSCOORDs) generally address priorities of fire, allocations of munitions and fire unit positioning while war-gaming fire support with various maneuver courses of action. However, we lack details in our estimates. The result is that paragraph 3b(2) of the operation order (OPORD) doesn't present a concept or scheme of fire support for the maneuver brigade or battalion task force. The paragraph simply allocates resources and announces the priority of fires.

Because we have no real concept for fires, we frequently piecemeal our fires around the battlefield with no significant effect on the opposing forces (OPFOR). The more successful fire supporters present an estimate that addresses—

- What fire support assets will be used.
- Where they'll be used on the battlefield.
- When they'll be used or the trigger event for the execution of fires.
- What the intended outcome for each major fire support engagement is.

Here's an example of a concept of fires:

"We'll mass CAS [close air support] and artillery deep at TAI [target area of interest] 1 or 2, depending on the enemy's decision to use avenue of approach 1 or 2. The objective is to attrit the enemy of one motorized company (MRC)(+). JAAT [joint air attack team] missions will be employed as the enemy moves across the open terrain between the cannalizing terrain at TAI 1 and 2 and the task-force engagement areas. Destroy another MRC (+). As the enemy approaches the brigade-directed obstacle, mass artillery fires to hit him as he bunches up against the obstacle and moves to the flanks in an attempt to bypass. Pound him with fire in the vicinity of the obstacle until I direct you to lift it."

This concept was *drawn* from the maneuver commander because the FSCOORD or FSO provided a meaningful estimate during the war-gaming process. From this concept of fires, the FSCOORD, FSOs and Field Artillery

battalion S3 can readily determine specified and implied tasks and develop fire support and Field Artillery support plans that satisfy the commander's concept and intent for fires.

Acquisition

Once we know where the major fire support engagement areas are on the battlefield, we must focus our acquisition assets on the areas where we'll kill the enemy. Many units use their mechanized platoon observers to accomplish this, in addition to combat observation lasing teams (COLTs) and OH58D helicopters.

Task-force FSOs often detach a platoon observer from a mechanized platoon and attach the observer to the task-force scouts, who are among the first to acquire the enemy. Task-force FSOs have inserted observers well forward to "pull the trigger" on deep fires. The NTC experience indicates that these deep observation posts' chances of survival, if well camouflaged, are greater than those in the task-force battle position. Task-force FSOs also have placed observers with E Company, when the company was task organized into a fifth maneuver team and assigned a critical engagement area. Some FSOs have placed observers with ground surveillance radars to pull the trigger on planned fires at night or on an obscured battlefield. Pooling observers this way allows FSCOORDs and FSOs to focus acquisition and provide *redundancy* in observation on planned targets critical to the success of the maneuver mission.

How many calls for fire did your platoon observers make during your last NTC rotation? Perhaps strict assignment of observation teams to mechanized platoons is not the way to go.

Target Location Error

Target location error still remains the biggest contributor to inaccurate fires. Because the ground-vehicular laser locator designator (G/VLLD) isn't eye safe, we can't use it during force-on-force operations at the NTC. The Hellfire ground support simulator (HGSS) is an eye-safe trainer that looks like and replicates the functions of the G/VLLD. The HGSS will be fielded at the NTC in April 1989.

Units should provide redundancy of observation on critical, planned targets.

In the meantime, we must continue to locate critical planned targets by intersection, resection, heading and vehicle odometer and map-terrain association. Company-team FSOs who can't derive an accurate grid readily using map-terrain association are generally successful when they resort to one of the other three methods.

Who should determine the grid for targets to cover obstacles? In some units, the task-force FSO gets the planned obstacle locations from the task-force engineer. What generally occurs from this kind of coordination is that the planned targets support the obstacle on the acetate overlay. However, the targets may not support the actual obstacle constructed on the ground.

The units I've seen that determine the grid best decentralize the planning of targets to cover obstacles. For example, the task-force FSO, in coordination with the engineer, is aware an obstacle is to be constructed. The task-force S3 directed "Team Charlie" to guard and cover it by direct fire. The task-force FSO directs Team Charlie's FSO to plan fires to support the obstacle, since the team FSO is in the best position to see where the obstacle is. He then reports the grids for the planned targets to the task-force FSO, after the obstacle has been constructed.

The OPFOR stalls at Blue Force obstacles at the NTC.

Fire Support Plan Rehearsals

Units and NTC observer-controllers emphasize fire support rehearsals because quality rehearsals result in more effective fires during execution. Maneuver commanders, FSCOORDs and FSOs must make time available for rehearsals.

Maneuver commanders use the "one-third, two-thirds" rule to allocate planning time. Fire supporters probably should use the "one-third, one-third, one-third" rule: allocate one-third of the time to develop the fire support plan, one-third to develop the Field Artillery support and CAS plans and one-third to rehearse.

Vantage-Point Rehearsal

I've seen units rehearse fire support plans several ways. Some units have key maneuver and fire support personnel move to a vantage point over the battlefield. From this high terrain, the task-force commander, his team commanders and staff and the task-force and team FSOs talk their way through each phase of the battle, referring to the map, graphics and actual terrain.

This isn't a war-gaming session. The decisions have been made. This is a confidence-building exercise to ensure each key member of the command knows what, where, when and how he's to execute his part of the operation order. Each maneuver commander talks through the position and movement of his units on the battlefield. Concurrently, task-force and company-team FSOs indicate the fires they'll call for, in accordance with the fire support execution matrix.

Target location error still remains the biggest contributor to inaccurate fires.

Terrain-Model Rehearsal

Another technique I've seen used is the terrain-model exercise. Basically, the staff constructs a terrain model on the ground outside the maneuver tactical operations center (TOC). Key personnel talk their way through the operation. Again, the FSOs participate in the exercise, indicating how they'll integrate fires during each maneuver phase. This technique is particularly useful if you don't have enough time to move to commanding terrain to see the battlefield. Also, the area of operation could be too large to see the majority of the zone or sector from a single vantage point.

Some units make the terrain model large enough so subordinate commanders and FSOs can walk on the model. Commanders and FSOs use these large terrain models to physically walk through the battle. Each rehearsal participant actually sees the unit on his left, right, front or rear in the person of the unit commander and his FSO. The exercise is similar to walking through football plays on a small portion of the playing field.

Map Rehearsal

Some units conduct a map rehearsal, particularly when they have limited time. Each subordinate commander steps up to the map in the TOC and briefs the senior maneuver commander on how his unit will implement the order. Subordinate FSOs rarely get involved in these rehearsals, and their commanders rarely talk about employing fire support for the operation. Discussion of fire support is generally limited to the senior FSO's briefing.

I've discussed rehearsals that integrate fire supporters and maneuver commanders. What about rehearsals that tie in the line of metal? Fire supporters generally complete their planning and participate in the maneuver rehearsal. However, the Field Artillery battalion TOC, which has just received the fire support plan, is deeply involved in planning while the maneuver rehearsal is going on.

Secure Voice-Net Rehearsal

More units are tying together fire supporters and the line of metal by having rehearsals for the fire supporters, artillery TOC, firing batteries, mortars and air liaison officer (ALO) after the Field Artillery support plan is complete. Usually, the rehearsal participants use a common secure voice net and a frequency that won't be used during the battle.

The senior FSO initiates the rehearsal, indicating the enemy is at TAI 1. At that time, the observer tasked to call in series JANE does so. If there's silence on the net after he gives the cue, this tells the senior FSO that responsibility hasn't been fixed for calling these planned fires. Units can correct the problem on the spot when all the key participants are on a common net. The observer who'll be calling in the fires actually makes the call for fire. He then states the target numbers and the respective grids that make up series JANE.

This exercise continues until they rehearse the entire fire support plan. The rehearsal ensures everyone is "on the same sheet of music" from the observer to the battery, platoon and mortar FDCs.

Benefits of Rehearsals

Units rarely include howitzer sections in rehearsals, though they should. The lack of rehearsals causes confusion and delays execution when the unexpected occurs, such as the requirement to traverse away from the collimator and sight on the aiming posts. Gun crews rarely encounter this situation at home station, but it's a strong probability at the NTC and in combat.

Rehearsals preclude problems during the execution such as "I don't have an E1B!"..."What's the grid for AB3001"..."I never received an FPF [final protective fires] called THUNDER?"..."Is it no fires north or south of ACA [airspace coordination area] JOE?"..."Fire the Illum; I'll send the grid later."

As units rehearse regularly, they begin to develop other good habits. To have time for rehearsals, they emphasize top-down fire planning. They keep target lists lean with well-placed targets that support the concept of fires. Plans are simpler. They fix responsibility for the execution of planned targets.

Late-Breaking Intelligence

There's a trend toward more top-down fire planning by FSOs. The intelligence preparation of the battlefield (IPB) products determine the targeting process, and the result is a shorter target

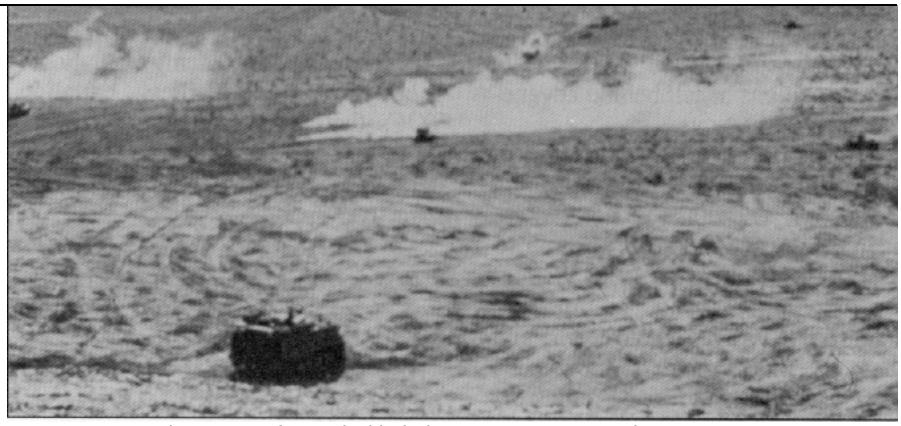
FSOs should exploit late-breaking intelligence to target known enemy locations.

list with well-thought-out target locations. During the offense, FSOs target likely and suspected enemy locations identified by the maneuver S2 and submit their target lists to the artillery battalion and mortar FDCs. However, when late-breaking intelligence comes in from the task-force scouts or other sources, the fire support element (FSE) rarely moves the planned targets from templated enemy locations to the *known* enemy positions.

The most common cause for this is a breakdown of coordination in the maneuver TOC. The FSO is usually forward with the maneuver command group when these known enemy positions are announced. He must rely on his FSE to coordinate with the artillery battalion and mortar platoon FDCs to refine planned target locations.

An FSE sergeant who isn't aware of the possibility of this late-emerging information may not arrange his sleep plan accordingly. He may not know that his FSE light shift (usually one soldier) must continually coordinate with the maneuver S2 during those few hours before the time to cross the line of departure (LD). The FSE light shift is typically a radio watch. Consequently, we don't get and react to this late-breaking intelligence.

Sometimes the fire support plan is too complicated to revise, so we just go with the plan. Revising the critical targets in the target list, groups of targets and schedules of fire is tough. Perhaps, rather than creating new target numbers, schedules and new groups of targets, we should change just the grids for the target numbers we already have. We'd have to work up new technical fire direction data for each target, but the target numbers in the series and groups of targets would remain the same. Usually those fires planned on templated enemy positions are in the general area of the known enemy positions. We can change the grids for target numbers rather than delete targets, assigning new target numbers and grids. This technique could minimize the disruption to the fire support plan that we've rehearsed.



FSCOORDs and FSOs are forward with their maneuver commanders.

Positioning FSCOORDs and FSOs

FSCOORDs and FSOs usually position themselves forward with their maneuver command groups during the execution of battles. The task-force FSO rides in the maneuver commander's "hard-skinned," tracked vehicle or in a second combat vehicle. The latter is common in armored task forces. The vehicle, crew and required radios are "taken out of hide."

Units should consider putting the FSO in the task-force ALO's track with augmented radios. This would enhance integration of CAS, indirect fires and JAAT operations and provide mobility and survivability to the FSO as well.

The FSCOORD may accompany the maneuver command group with his wheeled vehicle, ride in the brigade commander's track or have a separate combat vehicle, crew and radios. In the latter case, the FSCOORD may take an M113 armored personnel carrier from a mechanized company FSO. Usually, this vehicle comes from the non-deploying task-force fire support slice, so there's no impact at the NTC. I recommend the FSCOORD ride in the brigade commander's track, which is augmented with two radios.

Face-to-face coordination with the brigade commander has many advantages. It certainly reduces chances of confusion between the FSCOORD and the brigade commander. The brigade commander can talk to the FSCOORD on the vehicle intercom and point out fire support requirements to the FSCOORD on the map or actual terrain.

The FSCOORD also can monitor the brigade fire support coordination net (voice); the brigade FSO, task-force FSOs and Field Artillery battalion TOC are on this net. The FSCOORD can use this net to stay informed about the execution of the fire support plan. The FSCOORD also uses this voice net to influence the execution of fire support. For example, he could say to his battalion FDC, "I don't care what's in the queue next. Fire E1B now! An enemy motorized rifle battalion is stalled at the obstacle in engagement area FRED." On his second radio, the FSCOORD can monitor his Field Artillery battalion command net.

The trend is a positive one—FSCOORDS and FSOs recognize the need to be forward with their maneuver commanders to integrate fire support.

Observed Versus Unobserved Fires

The task-force FSO generates the majority of the calls for fire at the NTC. He acquires information on the enemy, monitoring the task-force command net. Frequently, the task-force commander turns to his FSO and says, "Put artillery in on check-point 18! Charlie Team reports an MRC is there." The task-force FSO looks at the situation map and sees that A2B is in the vicinity of checkpoint 18 and calls in the mission. The fires impact at A2B, but the enemy MRC is actually 1,500 meters north of check-point 18, and the fires are ineffective. Unobserved fires,

based on reports, usually miss static enemy positions or fall behind advancing enemy formations.

The task-force FSO could contact the Charlie Team FSO on the task-force fire support coordination net (voice) and tell him to get into a position to observe the enemy MRC in the vicinity of check-point 18 and call for fire. Then we'd have eyes on the enemy and where the rounds land. If the rounds miss the static enemy, we can adjust. If the rounds miss the moving enemy formations, we could drop back to another planned target along the enemy route of advance. Then we could place the fire unit "at my command" and pull the trigger as his motorized rifle battalion (two to three kilometers long, moving at 350 to 500 meters per minute) crosses our target.

Target Descriptions and Situation Reports

A fire direction officer (FDO) often hears a company FSO say "Fire AB2301!" He consults his target list and finds a target description of a road intersection. The FSOs shouldn't omit target descriptions in their calls for fire. If they do, we get a platoon firing one round of dual-purpose, improved conventional munition (DPICM) on an advancing motorized rifle battalion or tie up the fire net while the FDO chokes a target description out of the FSO. The artillery battalion S2 and FSEs also need this information to confirm enemy courses of action and orders of battle and to track decision support templates.

Company FSOs tend to say nothing on the radio unless they're calling in a fire mission. Company-team, frontline-trace reports are critical, but they're rarely called in to the task-force FSE. Without these reports, the FSE can't clear fires and maneuver operations may outrange artillery and mortars. Reports on company-team activities are important so the task-force FSO, FSE and artillery battalion TOC can stay informed on the friendly situation and anticipate fire support requirements. The FSEs that prompt company-team FSOs for reports can properly clear fires and stay apprised of the friendly and enemy situations. Likewise, Field Artillery battalion TOCs that prompt brigade and task-force FSEs for reports gain the same benefits and remain within range of maneuver operations.

FSE Operations and Net Architecture

Our FSEs are typically the weak link for fire support during most NTC rotations. The FSO is in the FSE during planning and supervises its activities while preparing and coordinating the fire support plan and during rehearsals. Just before the execution, the task-force FSO leaves the FSE and joins the command group. At this point, the FSE is undermanned. Efforts are in progress to add another NCO to the FSE authorization. In the meantime, some units are increasing their FSE personnel with observers or radio-telephone operators from the mechanized platoon observation teams.

Another aspect that impacts adversely on FSE operations is the state of training for the execution phase of the operation. FSE operations during the execution of the battle often degenerate into simply relaying calls for fire to the FDC. Personnel aren't behind specific voice and digital nets to monitor them and update the situation map or to track the battle and clear fires.

In many cases, we don't have a well-trained variable-format message entry device (VFMED) operator in the FSE. But the digital traffic flows and electronic line printer (ELP) paper piles up in the ELP tray. No one reads the printout, at least not in a timely manner.

Concurrently, FSOs are making voice calls for fire or requesting the FSE to relay calls for fire to the mortar or artillery FDCs. This combination of voice and digital traffic reaches a high tempo during battle and overwhelms the FSE.

Many task-force FSOs recognize the problem and handle it this way: "My FSE can't handle digital and voice calls for fire concurrently. Calls for fire by my company FSOs are predominantly voice. I don't have enough radios to monitor both digital and voice fire nets. Consequently, all my calls for fire should be by voice so my FSE can track the battle and clear fires."

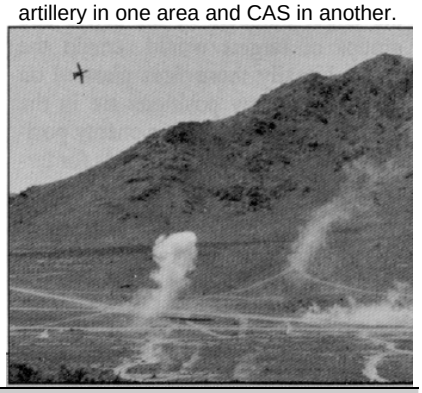
The majority of calls for fire are by voice at the NTC. Digital communication worked at home station when we talked from observation point (OP) 8 to firing-point 105. At the NTC where the unit operates over realistic distances and observers and FSOs are frequently on the low ground with their maneuver commanders, digital traffic isn't nearly as reliable.

Many units still retain all three fire nets as digital nets. The voice calls for fire then move to the brigade fire support coordination net. This net is for coordination among the FSCOORD, brigade FSO, task-force FSOs and artillery battalion TOC. If we use this net to process voice fire missions as well, we'll jam the net and won't be able to support coordination or the execution of fires responsively. We should consider taking one or more of the minimally used digital nets and converting them to voice fire nets.

Airspace Coordination Areas (ACAs)

Units usually employ informal ACAs. The task force usually nominates them and the brigade approves them. During the planning phase, FSOs often plan for many contingencies for CAS. The result is graphics that display complex, confusing on order ACAs. Those units that decide where they're going to employ CAS and design ACAs along identifiable terrain features have greater success.

ACAs are appropriate when units employ artillery in one area and CAS in another.



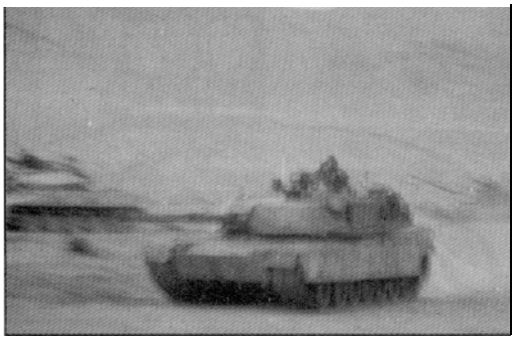
ACAs appear to be appropriate when units wish to employ artillery in one area and CAS in another. In this situation, informal ACAs serve well as a fire support coordination measure for the lateral separation of aircraft and projectiles. However, if we wish to employ CAS and indirect fire on the same general target area, ACAs may become a cumbersome coordination measure. It's very difficult to "turn ACAs on and off" and notify everyone affected by them.

I recently observed a unit use a combination of informal ACAs, positive control and time separation of CAS and artillery very successfully. It established an informal ACA to protect the aircraft from those indirect fire units not supporting the CAS or JAAT operation. The ACA basically was intended for non-participating brigades and fire units on the left and right of the unit employing the CAS. The task force employing the CAS then exercised positive control over the CAS and artillery. The unit gave "time hacks" to the artillery battalion and battery FDCs and the CAS pilots. It employed artillery to fire in the suppression of enemy air defense (SEAD). The last round was marked with a white phosphorous round. Based on the time required to fire the SEAD and the time hacks received earlier, the CAS came in within 30 seconds of the last impacting artillery round.

In one CAS mission, a COLT designated the target for the CAS. The pilots indicated they preferred laser designation to white phosphorous; it left no doubt as to which target to engage, and the laser spot was easy to acquire. This unit, the 24th Infantry Division (Mechanized) Artillery, conducts JAAT and CAS sustainment training exercises every six weeks to maintain proficiency. Units should call them for training tips on CAS and JAAT operations.

Jaws of Death

Maneuver commanders continue to dash into the OPFOR's jaws of death. During offensive operations, fire support isn't used to soften up the objective while battalion task forces assume



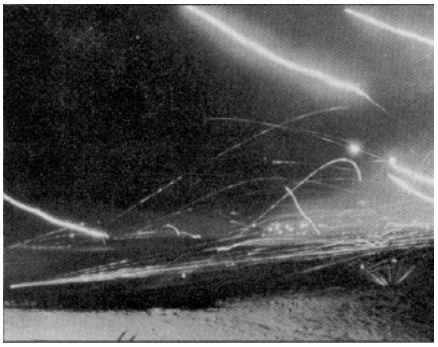
Maneuver commanders continue to dash into the “Jaws of Death.”

their positions for a coordinated attack. Task forces continue to breach OPFOR obstacles without the benefit of smoke to obscure the OPFOR's vision or suppressive indirect fires to make the OPFOR keep its head down.

Generally, fire support plans provide targets to support the attack and obstacle breaching. The problem is that maneuver commanders don't remain in dispersed formations outside enemy direct-fire range until the FSCOORD or FSO accomplishes the fire support tasks with adjusted, well-placed fires on a static enemy. The trend is to charge and engage OPFOR with direct fire. Those brigade and task-force commanders who employ fire support effectively meet little resistance on the objective and sustain considerably fewer losses.

Conclusion

Overall, units at the NTC provide more effective fire support than they provided two to three years ago. Direct-support battalion commanders understand and perform their FSCOORD role. They rely on their battalion S3 and executive officer to employ and maintain the line of metal. The more experienced officers usually become



Our units provide more effective fire support than they did two to three years ago.

the brigade and battalion task-force FSOs.

Fire supporters are gaining a greater understanding of the fundamentals of maneuver tactics. Company-team FSOs have assumed command of units when their commanders were killed and continued the fight. Firing batteries are more agile in moving about the battlefield.

Survey and meteorological support are on the upswing. Combat service support is aggressively managed as an integral part of the fire support effort. Fire support rehearsals are on the rise and OPFOR battle damage assessments are increasing. **Keep charging!**

Lieutenant Colonel William R. Brown is Chief of the Organization and Personnel Division of the Combat Developments Directorate at the US Army Field Artillery School (USAFAS), Fort Sill, Oklahoma. He was a player in three National Training Center (NTC) rotations. As Chief of the Fire Support Division, Operations Group at the NTC, Fort Irwin, California, he served as a fire support analyst and observer for 14 rotations. While at USAFAS, he observed two rotations and headed the NTC Trend Line Analysis study, which included researching fire support's performance in the Army Research Institute NTC Archives, Monterey, California. Lieutenant Colonel Brown served as Executive Officer and later Commander of the 3d Battalion, 19th Field Artillery, 5th Mechanized Infantry Division, Fort Polk, Louisiana.

Author's Guide

As editors of ***Field Artillery,*** we're looking for articles about tactics, training, doctrine, techniques, history, equipment, leadership—anything that affects our soldiers or the way they do business. In those articles, we want "meat": a description of a new concept, technique or piece of equipment with analysis of its impact on Field Artillery; a thorough examination of a problem with solutions in enough detail for units to implement them; or a discussion of history with analysis of points applicable to Field Artillery today.

What We Want

- A double-spaced typed, original, unpublished manuscript, which has no classified information in it. The length should range from one or two double-spaced pages to a maximum of about 14 pages or 2,500 words.
- A complete author's biography, highlighting experience and training that credentials you for the article. Include your full name and rank, current job title and telephone number.
- Graphics to support the article: black and white or color photographs, slides, posters, crests, maps, charts or graphs. For a 14-page, double-spaced typed manuscript, include *at least* four graphics. Graphics enhance the reader's understanding and increase your chances of publication.

What You Do

Call us when you have an idea for an article. We can talk about deadlines and other articles we've received on the same subject; this allows us to plan space for your article in an issue. Though we have a theme for each issue, we publish excellent, timely articles, regardless of the theme.

Write the article in the Army Writing Style. Organize your article and put the bottom line or thesis up front. Use the active voice and write relatively short sentences. Avoid jargon and spell out acronyms the first time you use them. Write sub-titles for sections of your article.

Staff your article to other experts and through your chain of command. Make sure your article is thorough, accurate and logical.

Call us if you're not going to make the deadline. We may negotiate another issue for your article to appear in.

What We Do

We staff all articles to subject matter experts. Your article's subject can be controversial; it *does not* have to agree with current doctrine or approved procedures. But it must be thorough, accurate and logical, have no classified information in it and must promote safe procedures.

We edit the article to conform to acceptable English usage, our format and style and our space limitations. In the interest of getting good ideas out to the field, we could condense the article to publish as a smaller feature, a letter to the editor or in our "Forward Observer" newsletter.

We send you a "check copy" of the edited version for you to review before we publish it.

Address:

Field Artillery
Post Office Box 33311
Fort Sill, Oklahoma 73503-0311

Telephone:

AUTOVON 639-5121 or 6806 or
Commercial (405) 351-5121 or 6806.

1989 *Field Artillery* Themes

Publication Date	Theme	Article Deadline
February	3x8: Transition in Tactics and Training	3 Oct 88
April	Counterfire	5 Dec 88
June	Artillery and Combat Service Support	6 Feb 89
August	Army's Theme or TBA	3 Apr 89
October	History of Field Artillery Tactics History Contest*:	15 Mar 89
	Regular:	5 Jun 89
December	Red Book	7 Aug 89

** Rules for the US Field Artillery Association's contest were in the August 1988* ***Field Artillery,*** *Page 17, "1989 History Writing Contest."*

Field Artillery Equipment and Munitions: *Changes for the 1990s*

This section describes Field Artillery equipment and munitions you'll see "on your watch" — through the early 1990s. Unlike last year's equipment section, this section includes only those items that have changed or are new.

Cannon

M109-HIP

The M109 howitzer improvement program (HIP) is modernizing the Army's fleet of M109A2 and M109A3 155-mm self-propelled howitzers rapidly. First fielded in the 1960s, the M109 family of howitzers has become the venerable workhorse of the Field Artillery. It fires in direct support of all armored and mechanized divisions and in general support of the Marine divisions.

The M109A3E2 HIP howitzer fielding should begin in FY 91 and continue for four years. The program will improve 1,700 M109A2 and M109A3s, including those in all active M109 battalions and selected National Guard units.

HIP Improvements

Survivability

- New Turret for Improved Ballistic Protection
- Nuclear, Biological and Chemical (NBC) Collective Protection and Micro-Climate Conditioning System
- Remotely Operated Travel Lock
- Modular Azimuth Positioning System (MAPS)
- Reduced Vulnerability

Responsiveness

- Automatic Fire Control
- AN/VRC89 Single-Channel, Ground and Airborne Radio System (SINCGARS)
- Gun Drive Servo

Reliability, Availability and Maintainability (RAM)

- Prognostic and Diagnostic Systems
- Upgraded Hydraulic and Electrical Systems
- Desert Engine Cooling System
- Modified Armament System (MAS)

Capabilities

- Increased Range
- Compatibility with all 155-mm Munitions

M198-PIP

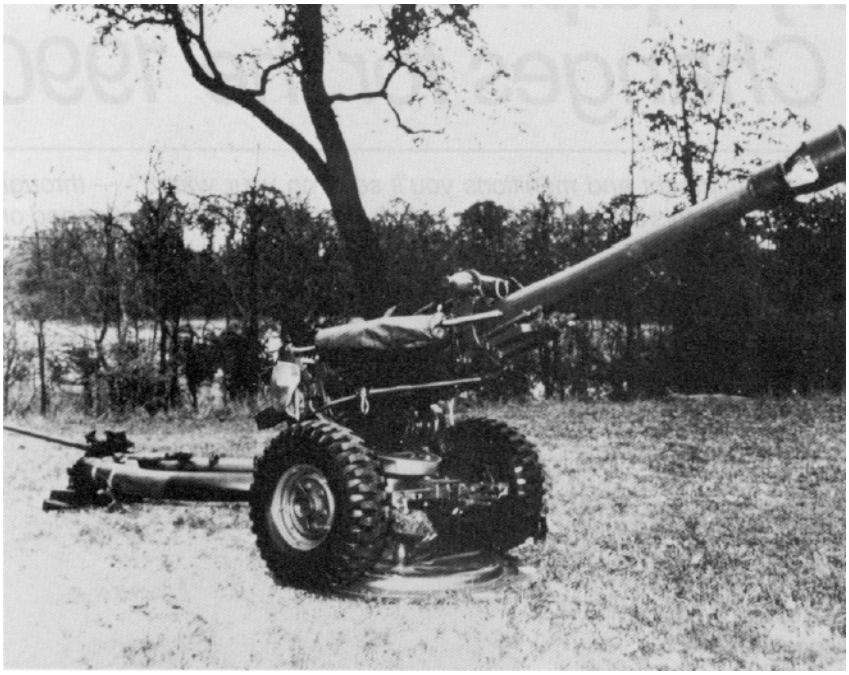
A 1984 fielded-system review (FSR) identified shortcomings of the M198 155-mm towed howitzer. In 1985, the Army began the product improvement program (PIP) to increase the reliability and maintainability of the M198.

The PIP adds or changes 39 parts and improves the howitzers in eight general areas. These improvements are in the brake system, equilibrator adjusting assembly, locking devices and attaching hardware, trail accessories, moisture accumulation system, bottom carriage, equilibrator-recuperator valve and the transverse-angle drive unit.

The Army expects to modify the first howitzers by FY 91 and finish within three years. The Marines haven't decided yet how many of the PIP improvements they'll make to their howitzers.

The M198 replaced the M114A1 in most units. More reliable than its predecessor, the M198 has a greater range — up to 30 kms with rocket assisted projectiles (RAP). Although 20 percent heavier than the M114A1, the M198 is still light enough to be airlifted by CH47D and CH53E helicopters.

The M198 fires in general support of non-mechanized divisions and in direct support of motorized and Marine divisions.

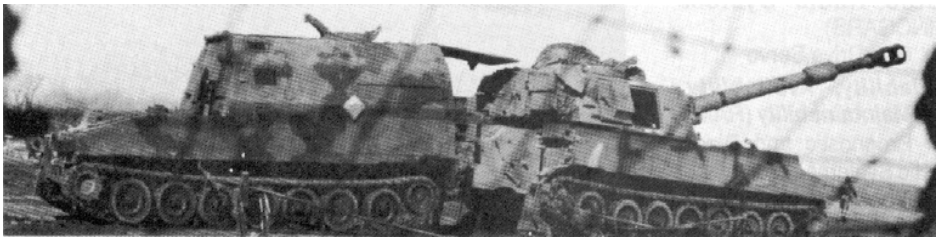


M119

The Army is currently buying the M109 105-mm lightweight howitzers from the United Kingdom. They will replace the M102 and M101A1 howitzers and also be issued to light infantry divisions and rapid deployment forces, beginning in FY 89. The Army plans to buy and deploy 548 howitzers by 1996.

The 4,100-pound M119 fires all conventional 105-mm ammunition as well as RAP and dual-purpose improved conventional munitions (DPICM).

The howitzer can be towed by a highly mobile multipurpose wheeled vehicle (HMMW), carried by the UH60 helicopter or parachuted from C130 aircraft.



FAASV

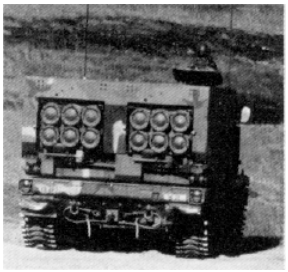
The Army Training Center at Fort Sill, two battalions at Fort Hood, Texas, and the 2d Armored Division's prepositioned stocks in Germany already have the Field Artillery ammunition support vehicle (FAASV). The 155-mm howitzer units in Europe and Korea also will receive the FAASV, with fielding completed in FY 91.

The Army developed a 155-mm version of the FAASV, the M992, and an 8-inch version, the M1050. The Army hasn't funded the M1050 version.

The FAASV provides crewmembers ballistic protection and incorporates ammunition handling devices. It's built on an extended M109 chassis with a large armored housing replacing the turret. The FAASV has—

- Racks to store 90 rounds horizontally.
- A Conveyor to deliver rounds directly to the howitzer.
- An X-Y stacker to load and unload ammunition into the storage racks.
- Simplified test equipment for the internal combustion engine (STE/ICE).
- An auxiliary power unit (APU) to run the ammunition handling equipment (AHE) in the FAASV and power the howitzer in the firing mode.
- A collective NBC system to protect four crew members working in a contaminated environment.
- An Automatic fire suppression system to extinguish hydrocarbon fires.

Rockets and Missiles



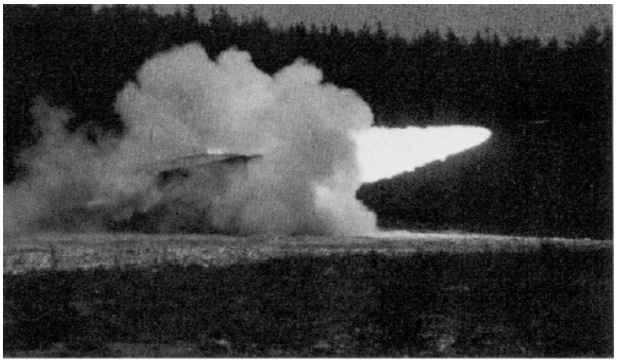
MLRS

Fielding of the multiple launch rocket system (MLRS) continues but may be affected by changes in the echelons above-division (EAD) transition plan. The EAD transition plan currently is being revised in response to the Intermediate-Range Nuclear Forces (INF) Treaty. The Army plans to field MLRS to all active, National Guard and Reserve units by 2016. All heavy divisions and the three corps now have MLRS.

The MLRS is a highly mobile, free-flight rocket system. Each MLRS battery has nine M270 launchers and enough command, control and logistics assets for limited autonomous operations. Infantry, mechanized and armored divisions have organic MLRS batteries. Maneuver corps have an

MLRS battalion, each with three firing batteries.

Each MLRS launcher can receive a fire mission, locate itself, compute firing data, orient itself and fire up to 12 rockets. The rockets can range out to more than 30 kms. MLRS rockets carry M77 dual purpose improved conventional munitions (DPICM). The Army is developing other warheads for MLRS, such as the terminal guidance warhead (TGW) being developed multinationally, sense and destroy armor (SADARM) and the binary chemical warhead (BCW). NATO nations may adapt the MLRS to carry the German-made antitank (ATII) scatterable mine. The Army TACMS with a suite of conventional warheads also is being developed. Collectively, the new rockets and Army TACMS missiles are called the MLRS family of munitions (MFOM).

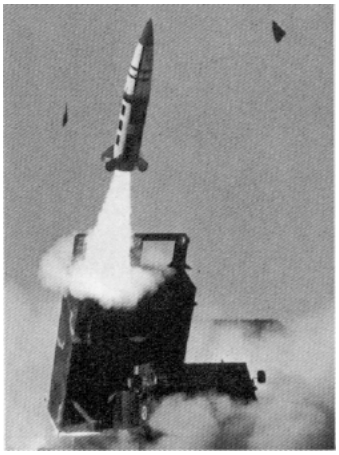


Army TACMS

The Army tactical missile system (Army TACMS) will replace conventional Lance, beginning in FY 91. Fired from the M270 launcher, this semi-ballistic, guided missile engages targets at operational depths. As of July 1988, there have been three successful test flights of the new missile.

Army TACMS improves on Lance by firing faster, farther and using less manpower. Planners envision a two-block family of warheads for the system. Block I will be antipersonnel, anti-materiel (APAM) munitions. Block II has smart warheads designed to kill hard moving targets. The M270 launcher with Version 6 software will be able to fire the Army TACMS missile as well as other MFOM.

Army TACMS allows the corps commander to engage second-echelon targets beyond the range of cannon and MLRS fires.



Lance SLEP

The Lance service life extension program (SLEP) continues to ensure the reliability and readiness of the Lance missile system into the mid-1990s. Since 1984, this program has improved the main missile assembly (MMA), warhead and supporting hardware.

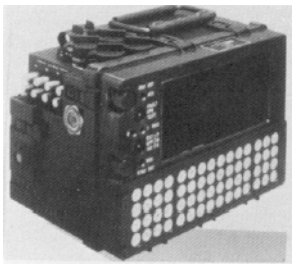
Lance is a deep-attack missile that allows the corps commander to attack targets well beyond the range of cannon and rockets. Lance can attack soft targets using conventional munitions at ranges of up to 91 kms. Using nuclear munitions, Lance can attack targets at ranges up to 133 kms.

Pershing II

The Intermediate-Range Nuclear Forces (INF) Treaty signed by the US and USSR in 1987 eliminates The Pershing II (PII) and other intermediate-range nuclear missiles over the next three years. In turn, the Soviets will destroy their intermediate-range nuclear systems.

The first Pershing missile, a track-mounted system with a 400-mile range, was fielded in 1961. Pershing IA (PIA) improved the older system in 1968. The PII replaced the PIA in 1985. It has a 1,000-mile range and much greater accuracy.

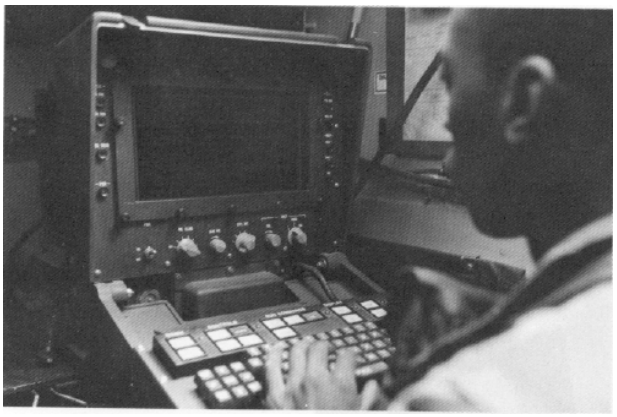
Command and Control



FIST DMD

The Fire support team digital message device (FIST DMD) began fielding in September 1988. The Army plans to give one FIST DMD to each FIST headquarters.

The FIST DMD can display, store, edit, monitor and forward fire missions from platoon forward observers' (FOs) DMDs. It is similar to the standard DMD in design and format. It "talks" on four channels to up to 20 different subscribers. Its message buffers holds 20 received messages and its message copy file stores the last 16 transmitted messages. The FIST DMD can store and automatically update data for 36 missions. It can process two fire missions at once and can hold seven off-line for later use.



BCS

A project to increase the memory in the battery computer system (BCS) should be complete by the middle of FY 89. The modification would increase memory from 128K to 256K, 24-bit words and allow the BCS to use improved software.

The Army Materiel Command (AMC) is withholding Version 8 software for the BCS and plans to field Version 9 in FY 90.

The BCS is the Army's fire direction computer for cannon batteries. The BCS consists of the battery computer unit (BCU) configured with one gun display unit (GDU) per howitzer. It controls the fires of up to 12 weapons at once, applies non-standard ballistic parameters, performs basic survey routines and stores mission data and fire plans. It also works with the automated fire control system (AFCS) on the HIP howitzer.

BUCS

Revision 1 to the backup computer system (BUCS) will update cannon, Lance and survey software. The updated chips speed up fire mission processing; add munitions, including Copperhead; and allow BUCS to compute gunnery solutions for all US howitzers, including the M119. The Army expects to field the Lance and survey chips in mid-FY 89. The cannon chips will be available sometime in FY 90.

The Army is also introducing a new nuclear target planning (NTP) chip to be fielded in late FY 89.

The BUCS, a handheld computer, calculates gunnery and survey solutions for cannon and Lance units if their BCS fails. Units with no BCS use BUCS as their primary computer.

FDS

The fire direction system (FDS) performs fire direction in Lance and MLRS units. The FDS is built around the same basic component as the BCS. It consists of a BCU configured with the AN/UGC74A printer, secure communications equipment and radios. The FDS digitally links the battery and battalion fire direction centers (FDCs) to the tactical fire direction system (TACFIRE), MLRS M270 launcher fire control systems (FCSs) MLRS platoon leaders' and other target acquisition assets.

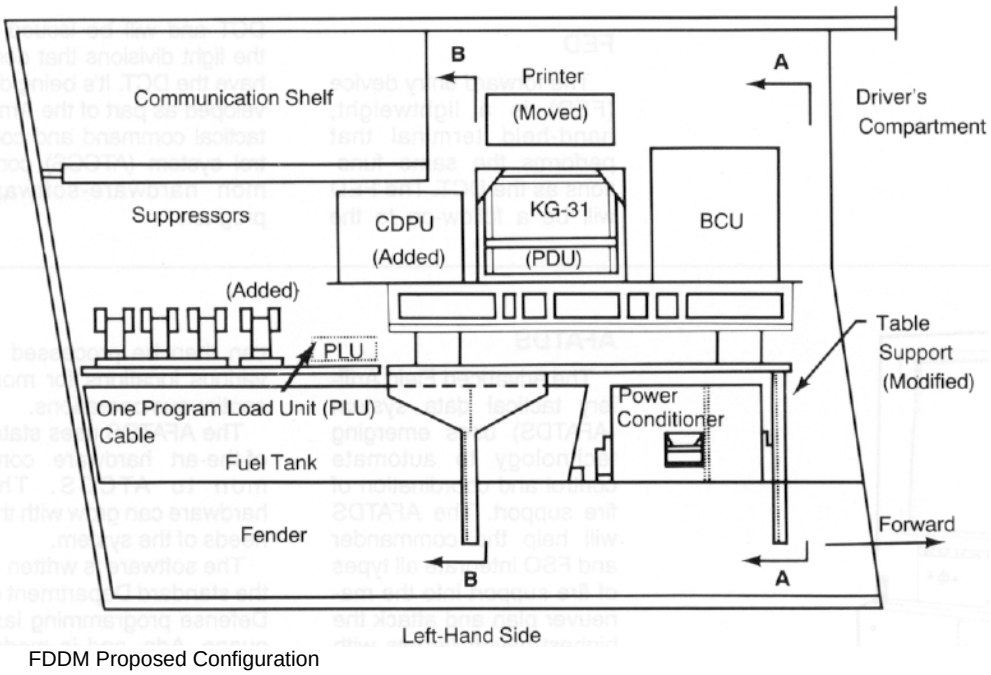
The AMC will release FDS Version 9 software in FY 90, which will contain both MLRS and Lance programs.

FDDM

The fire direction data manager (FDDM) improves the MLRS FDS by increasing the battery computer unit's (BCU) processing, storage and communications capability. FDDM will give the fire support element (FSE) tactical fire control of rockets and missiles not possible with TACFIRE. The FDDM will have the ability to talk to TACFIRE or the new Army tactical command and control system (ATCCS).

The FDDM hardware fits into the M577 command post vehicle. It consists of a modified BCU and a communications and data processing unit (CDPU). Two mini-vax computers make up the CDPU, which forms the heart of the product improvement. One mini-vax processes data; the other handles communications.

Plans call for the FDDM to reach the field in conjunction with MFOM and Army TACMS fieldings, and it will remain until replaced by the advanced Field Artillery tactical data system (AFATDS). In Europe and Korea, the Army will start issuing FDDM to MLRS batteries, battalion FDCs and division and corps FSEs in FY 90.



FDDM Proposed Configuration

TACFIRE Product Improvements: Counterfire PIP and L3212D

The counterfire product improvement program (PIP) improves the operational capability of Field Artillery brigade and Div Arty tactical operations centers (TOCs). The program moves the electronic tactical display (ETD) and one of the two electronic line printers (ELPs) from the TACFIRE shelter to the section's expandable van. Counterfire information will now come directly into the van where there's more space to work. The PIP has already begun and will continue through FY 89.

The L3212D PIP will replace the central processing unit (CPU), input-output unit (IOU) and four mass core memory units (MCMU) with the L2312D emulator in all Field Artillery brigade, Div Arty and Corps Arty TACFIRE sets. This reduces the number of circuit cards, power requirements, weight and size of the system. The program places all the TACFIRE components into one shelter for brigade and Div Arty computers.

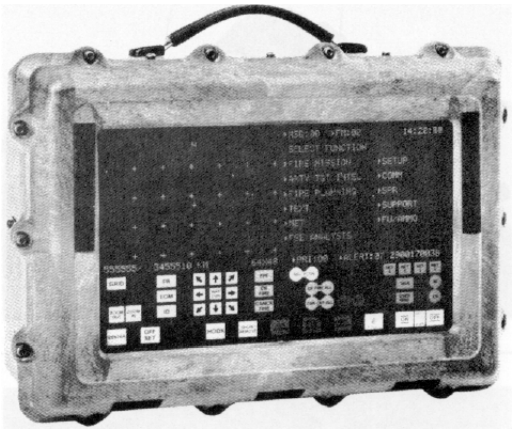
Fielding is scheduled to begin in June 1989 and be completed in a year.

LTACFIRE

Lightweight TACFIRE gives selected Field Artillery centers in the light divisions limited tactical fire direction and fire planning capabilities. The LTACFIRE Version 8 can do everything TACFIRE Version 8 does, except nuclear and chemical fire planning.

The LTACFIRE's main component, the briefcase terminal (BCT), is lightweight (35 pounds), portable and rugged. It processes, formats, communicates and displays data. FDCs at battalion and Div Arty use a dual BCT configuration. Fire support cells use a single BCT, called an intelligent terminal.

Fielding of LTACFIRE to the light infantry divisions begins in early FY 90.



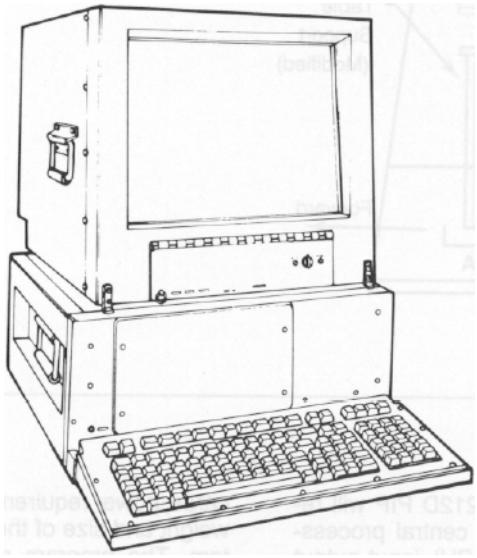
DCT

The digital communications terminal (DCT) is a lightweight, hand-held device that performs the same functions in the light divisions as the DMD in the heavy divisions. The message processor can compose, edit, address and check messages for errors.

The DCT will be fielded in only two light divisions: the 7th Infantry and 82d Airborne Divisions. It will be issued to those divisions' FOs, FISTs, battalion and brigade fire support officers (FSOs) and Field Artillery battalion and Div Arty commanders.

FED

The forward entry device (FED) is a lightweight, hand-held terminal that performs the same functions as the DCT. The FED will be a follow-on to the DCT and will be issued to the light divisions that don't have the DCT. It's being developed as part of the Army tactical command and control system (ATCCS) common hardware-software program.



AFATDS

The advanced Field Artillery tactical data system (AFATDS) uses emerging technology to automate control and coordination of fire support. The AFATDS will help the commander and FSO integrate all types of fire support into the maneuver plan and attack the highest-payoff targets with the most effective munitions at the critical time.

The AFATDS replaces TACFIRE and its variable format message entry device (VFMED) with a system of interconnected computers. Battlefield data can then be processed at various locations for more continuous operations.

The AFATDS uses state-of-the-art hardware common to ATCCS. The hardware can grow with the needs of the system.

The software is written in the standard Department of Defense programming language, Ada, and is modular, making upgrades easier. The AFATDS will work with current and future fire control systems, ATCCS and several allied fire support systems.

Fort Sill will test AFATDS concepts in FY 89.

Target Acquisition

FSV

The fire support vehicle (FSV) program is modifying M113-series armored personnel carriers (APCs) to M981 configuration for artillery observers in mechanized and armored forces.

The M981 FSV is already used in many locations worldwide. The Army should complete fielding to continental United States (CONUS)-based units in FY 90.

The M981 FSV is a versatile target acquisition vehicle. It can "talk" to artillery command posts or firing units by voice or digital message. The operator can raise or lower the FSV's top mounted "hammerhead," which houses a ground-vehicular laser locator designator (G/VLLD), the AN/TAS-4 night sight and a north-seeking gyrocompass. The 14-ton FSV can transport its four-man crew at speeds of up to 35 mph. It cruises up to 300 miles on a tank of fuel.

Each FIST and brigade combat observation lasing team (COLT) in heavy divisions will have the FSV.

OH58D

The current fielding plan calls for 10 active divisions to each receive six OH58D observation helicopters. The plan also gives additional aircraft to separate artillery brigades supporting V Corps, VII Corps and the XVIII Airborne Corps.

The OH58D is a fully integrated aerial platform for target acquisition, designation and handoff. It flies in adverse weather, day or night.

An aerial fire support observer (AFSO) and a pilot man the helicopter. The AFSO uses the aircraft's

mission equipment to coordinate all fire support, gather vital intelligence and assess tactical damage.

The OH58D carries impressive equipment. An attitude heading and reference system (AHRS) constantly displays aircraft position, attitude, altitude and heading. A laser rangefinder-designator (LRFD) calculates eight-digit grid coordinates accurately enough for first-round fire-for-effect. It allows Hellfire, Copperhead and other laser-guided munitions to be pinpoint accurate. An airborne target handover system (ATHS) communicates digitally with TACFIRE and other digital message devices.

Firefinder

The Firefinder improvement program will increase the survivability of Fire-finder radars. The program will mount the radar on a single vehicle that is as mobile as the forces it supports. Other improvements include faster emplacement and displacement, increased target throughput, reduced crew size and the ability to transmit data while moving. The Army will begin fielding the improved firefinders to light forces in 1992 and heavy forces in 1996.

The Firefinder radars, AN/TPQ-36 (Q36) and AN/TPQ-37 (Q37), detect and locate artillery and mortars quickly and accurately. Both can locate 10 weapons firing at the same time and store up to 99 targets.

The Q36 has a maximum range of 24 kms and a normal search sector of 1,600 mils. It can cover a 6,400-mil sector in the extended azimuth mode.

The Q-37 has a maximum range of 50 kms and a 1,600-mil search sector.

G/VLLD

Selected units in Europe, Korea and CONUS already have ground-vehicular laser locator designators (G/VLLDs). Worldwide fielding will continue into 1990.

The G/VLLD finds the range, azimuth and elevation of targets and reports the information through the FIST DMD, saving time and ammunition. It also can project an invisible, coded laser spot to guide munitions such as Copperhead, Hell-fire and Maverick on to targets. The laser spot tracker in close air support aircraft helps pilots find the target and attack it on the first pass with either conventional or precision-guided munitions (PGMs).

The G/VLLD can be mounted on the FSV, high-mobility, multipurpose wheeled vehicle (HMMWV) or tripod for ground operations.

Meteorology and Survey

MDS

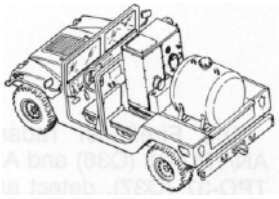
The Army began fielding 55 meteorological data systems (MDS) in the third quarter of FY 88. Fielding will continue through FY 90.

The MDS, a mobile, automated system, collects, processes and transmits meteorological data to FDCs. It operates digitally with TACFIRE, BCS and AFATDS. The MDS also provides information to predict radiological fallout and forecast weather.

A 5-ton vehicle with a S280 shelter carries the non-radiating ground acquisition and processing station. Battery-powered meteorological radiosondes are mounted in a trailer behind the 5-ton truck.

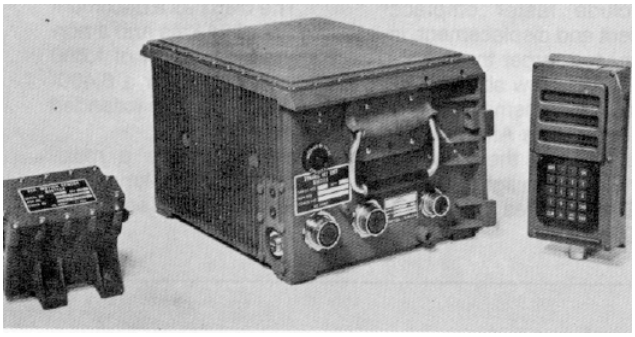
LAMS

The lightweight artillery meteorological system (LAMS) will consist of a non-radiating ground acquisition and processing system. The Army will buy the system off the shelf to support light, airborne and air assault divisions and all Reserve Component units. The first LAMS should be fielded by late FY 90.



MHG

The meteorological hydrogen generator (MHG) will replace the AN/TMQ-3 hydrogen generator set in all artillery meteorological sections. It will generate 150 cubic feet of hydrogen gas per hour and store up to 300 cubic feet. The Army approved the operational and organizational (O&O) plan on 17 November 1986. Cost and reliability, availability and maintainability (RAM) studies are ongoing. Fielding of the first MHG is tentatively set for FY 92.

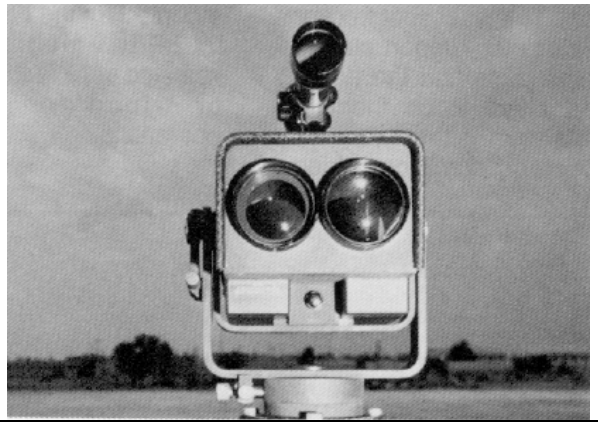


MAPS

The new modular azimuth positioning system (MAPS) will quickly and constantly inform combat vehicle crews of their location, even when they're "buttoned up." It will be part of the overall fire and sensor control system standard in many vehicles.

The MAPS currently depends on PADS for initialization and update data. Eventually MAPS will be equipped with an on-board global positioning system (GPS) receiver. The GPS receiver will permit self-contained initialization and periodic updates.

Various weapon and sensor systems will use MAPS, including the M109-series howitzers, towed howitzers, Lance, Patriot and Firefinder II radars. The first and largest user of MAPS will be M109A3E2 HIP, scheduled for fielding in FY 91.

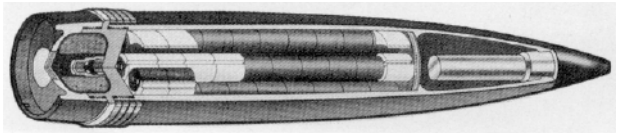


SEDME-MR

The survey electronic distance measuring equipment-medium range (SEDME-MR) is a military version of lightweight commercial equipment. It measures from 30 to 7,000 meters in a few seconds. Operating day or night, it allows conventional survey parties to provide fast, accurate survey control. When used with other conventional survey equipment, it adds flexibility to PADS operations.

The SEDME-MR is replacing the distance-measuring microwave system and the DM60. Each conventional survey party in Active or Reserve Component artillery units will receive one instrument.

Munitions



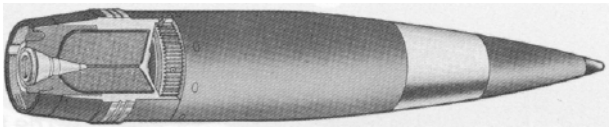
M864 ERDPICM

The M864 extended-range, dual-purpose improved conventional munitions (ERDPICM) projectile takes advantage of base-bleed technology to achieve a 20 to 30 percent increase in range over the M483 DPICM. The base-bleed element ignites upon firing and creates a positive pressure behind the base of the projectile which reduces atmospheric drag. It reaches ranges of up to 22 and 27 kms when fired with the M119 and M203 propelling charges, respectively.

The M864 is in full-scale development. Initial operational capability (IOC) is scheduled for early FY 89.

XM785 Nuclear RAP

The XM785 nuclear rocket assisted projectile (RAP) will be more reliable, range farther and produce higher yields than the current M454. All US and NATO 155-mm howitzers will be able to fire the XM785. Developers are now testing the projectile, with fielding two to three years away.



XM773 MOFA fuze

The Field Artillery currently uses 17 different fuze types and models. The XM773 multi-option fuze artillery (MOFA) will reduce this number to two, easing our logistical and operational problems.

The XM773 MOFA will perform four fuze actions now provided by several fuses used with burster-type projectiles. It will provide up to a 199.9-second electronic time fuze, a variable-height proximity fuze, a delay function and a penetrator for up to 12 inches of mortared brick.

The MOFA will replace the following fuzes: mechanical time super quick (MTSQ) M564, M582, M557, M739 and M739A1; proximity (VT) M513, M514, M728 and M732; and electronic time M767. It will be compatible with all fielded and developmental bursting projectiles for the 105-mm, 155-mm and 203-mm howitzers. Fielding for the MOFA should begin in the middle of FY 97.

US Army Field Artillery Assignments Branches

Branch Representatives as of 1 Oct 88

Army Active Branch Teams

Officers

LTC Joseph P. Monko, Jr.
Field Artillery
Branch Chief

LTC Leo J. Baxter
Colonel
Assignments

MAJ Stephen C. Randolph
Lieutenant Colonel
Assignments

MAJ Arnold Smith
Major Assignments

CPT Mark A. Graham
Captain Assignments:
Functional Area/Nominative

CPT Thomas W. Weafer
Captain Assignments:
Troop/Advanced
Course Follow-On
Assignments

CPT Ann L. Horner
Lieutenant Assignments/Accessions

CPT Thomas J. O'Donnell
Lieutenant Assignments/Officer
Advanced Course/Lieutenant Colonel
Precommand Course

CW3 George B. Chiassion
Warrant Officer
Assignments

Fort Sill Representative for Officer Basic and Advanced Courses follow-on assignments is CPT Jefferson G. Ewing, AUTOVON 639-5206/6373.

Mailing Address and Telephone:

Lieutenant Colonels and Below

Commander, TAPA
ATTN: DAPC-OPE-F
200 Stovall Street
Alexandria, VA 22332-0414
Telephone: AUTOVON 221-xxxx
Commercial (202) 325-xxxx
Company Grade: 0187/0116
Field Grade: 7817/0118

Lieutenant Colonels (P) and Colonels

Commander, TAPA
ATTN: DAPC-OPC
200 Stovall Street
Alexandria, VA 22332-0400
Telephone: AUTOVON 221-7862/7863
Commercial (202)
325-7862/7863

Officers' Microfiche Records

Commander, TAPA
ATTN: DAPC-MSR-S
200 Stovall Street
Alexandria, VA 22332-0460

Enlisted

MAJ (P) Daniel L. Breitenbach
Field Artillery
Branch Chief

SGM Gordon D. Pauly
Branch Sergeant Major

MSG Donald R. Givins
13Z, 13B (E-7)/Recruiting Duty

SFC David K. Nichols
13B (E-6 and Below), 13C, 13E,
13F/Drill SGT Duty

SFC Dennis P. Gano
13N, 13M, 13P, 13R, 15E, 21G, 82C,
93F

SFC Moneshwar C. Darsan
Reclassification

SFC Samuel H. Powell
ANCOC/Qualitative
Management/Retirements

Mailing Address:

Commander, TAPA
ATTN: DAPC-EPK-F
2461 Eisenhower Avenue
Alexandria, VA 22331-0452
Telephone: AUTOVON 221-0304
Commercial (202) 325-0304

Army Reserve Branch Teams

Officers

LTC Joe Rogers
Field Artillery
Branch Chief
Lieutenant Colonels

MAJ Timothy R. McLaughlin, Jr.
Majors

MAJ Peter A. Youngblood
Captains with last SSN
digits of 00-49

CPT Danny D. Henson
Captains with last SSN
digits of 50-99

MAJ Cecil Chambliss, Jr.
Lieutenants

Mailing Address:

Commander, ARPERCEN
ATTN: DARP-OPC-FA
9700 Page Boulevard
St. Louis, MO 63132-5200
Telephone: AUTOVON
693-7871/7873/7351
Commercial (314)
263-7871/7873/7351
Toll Free 1-800-325-4950

Enlisted

SFC Richard D. Dorohovich
Field Artillery/Air Defense
Branch Chief

SFC George R. Varner
Last SSN
digits of 00-24

SFC Johan H. Kohler
Last SSN
digits of 25-49

SSG Johnny R. Fisher
Last SSN
digits of 50-61

SFC David L. Sheline
Last SSN
digits of 62-86

SSG Leroy Fluke
Last SSN
digits of 87-99

Mailing Address:

Commander, ARPERCEN
ATTN: DARP-EPA-FA/ADA
9700 Page Boulevard
St. Louis, MO 63132-5200
Telephone: AUTOVON 693-7614
Commercial (314)263-7614
Toll Free 1-800-325-4730

1988 Redleg Reference

*The following is a list of articles and selected items from "On the Move (OM)," "View from the Blockhouse" (VB), "Incoming" (INC), "Redleg News" (RN), "Right by Piece" (RP) and "Fragments" (FRAG) appearing in **Field Artillery** during calendar year 1988. The entries are categorized by subject and listed by title and issue.*

Ammunition and Fuzes

Copperhead Firing Procedures (VB), Feb
Safety: M577 and M582 Fuze Identification (VB), Feb
Transporting Copperhead in the M109A2 and M109A3 Howitzers (VB), Feb
Rocket-Propelled Line Charge (FRAG), Apr
New Munitions for the Improved 81-mm Mortar (FRAG), Aug
SAFETY: Ammunition Handling (VB), Aug
Ammo Slings for the HEMTT (VB), Oct
Field Artillery Ammunition Resupply Solutions, Oct
SAFETY in the 8-inch Community: Obturator Spindle (VB), Oct
Field Artillery Equipment and Munitions: Changes for the 1990s, Dec

Combat Support and Service Support

Artillery Logistics—The Other Side of Battle, Apr
Engineer Support of Field Artillery Defensive Operations, Apr
Field Artillery Ammunition Resupply Solutions, Oct

Equipment and Technology

Field Artillery Vision: Master Plan for Fire Support of the Future, Feb
JOINT STARS Looks Deep To Win (A look at the joint surveillance target attack radar system), Feb
RPV: Above the Threat, Feb
Army to Receive TOW 2A Missiles and Cobra-Nite (VB), Apr
Quiet Generators (FRAG), Apr
BATTLEKING: Manpack Global Positioning System (VB), Apr
Rocket-Propelled Line Charge (FRAG), Apr
Survivable Hardware Coming? You Can Bet On It!, Apr
Lasers: Direct-Fire Weapons For and Against Us, Jun
Multi-Dimensional Concept: The Force Multiplier for Future Battlefields, Jun
New M40 Protective Mask (VB), Jun
New Munitions for the 81-mm Mortar (FRAG), Aug
Army TACMS Fired Three Bull's Eyes (RN), Oct
The HIP Connection, Oct
MSE (Mobile Subscriber Equipment), Oct
M113 Unsafe for Amphibious Training (RN), Oct
OH58D: The New Eye on the Battlefield (RP), Oct
Redleg Leathernecks: Marine Corps Fielding Computer Systems (VB), Oct
Field Artillery Equipment and Munitions: Changes for the 1990s, Dec
Field Artillery State-of-the-Branch Address, Dec
Fire Support's Future in Emerging Technology, Dec

Gunnery

BUCS as a Backup (INC), Feb
Copperhead Firing Procedures (VB), Feb
Polaris 2 Update (VB), Feb
TAPS Role Expanded (VB), Feb
Coordinated Illumination (INC), Apr
Replot Procedures for BUCS (INC), Apr
Getting a Grip on Muzzle Velocities, Oct

History

Guns of Manchuria (Russo-Japanese War), Apr
The Evolution of Soviet Fire Support, 1940-1988, Jun
Redleg Leathernecks and the Medal of Honor, Jun
Combined-Arms Operations in the Franco-German War of 1870-1871, Aug
Countering the Sappers, Aug
The Dress Rehearsal: Lost Artillery Lessons of the 1912-1913 Balkan Wars, Aug
Fortresses and Firepower in Vietnam, Aug
On Time—On Target: The Birth of Modern American Artillery, Aug
The Ramadan War: Fire Support Egyptian Style, Aug
Truth in History (OM), Aug

Joint and Combined Operations

After Grenada: Joint Operations in the 82d Airborne Division, Feb
ALFA Agency: Bridging the Interoperability Gap (FRAG), Feb
Certain Strike: REFORGER 87, An Artillery Overview, Feb
III Corps Redlegs on REFORGER, Feb
Exploit Technology to Defend NATO, An Interview with General Jack M. Merritt, US Representative to the NATO Military Committee, Feb
Field Artillery Vision: Master Plan for Fire Support of the Future, Feb
JAAT Planning: Getting the Most from Synchronized Forces, Feb
JOINT STARS Look Deep to Win, Feb
A NATO Primer on Battlefield Air Interdiction, Feb
Naval Gunfire Support: What We Need to Understand, Feb
The US Air Force Ground Operations School (FRAG), Feb
Future Artillery Standards—A Step in the Right Direction (FRAG), Jun
Operations at the JRTC: Fire Support Issues, Jun
Supporting Arms Coordination Center (FRAG), Jun
The Key to Field Artillery—Focusing Combat Power, An interview with General Crosbie E. Saint, CINCUSAREUR, Oct

Leadership and Personnel

Cannon MOS Career Guide, Feb
Three Enlisted Paths to a Commission (RN), Feb
Wanted: Redleg Rangers, Feb
Another Way to Organize a Headquarters Battery (INC), Apr
Fire Support Coordinators, The Keys to Fire Support (INC), Apr
FM 22-103 Leadership and Command at Senior Levels (INC), Apr
New Officer Basic Course Better Prepares Lieutenants for First Assignments (VB), Apr
Redlegs Must Be Regimental (RN), Apr
Rocket and Missile MOS Career Guide, Apr
Field Artillery Restructures Survey Sections (VB), Jun
Fire the Prep: Some Thoughts About Direct Support, Jun

Intra-Theater Transfers Result in Longer Overseas Tours (VB), Jun
Radar, Survey and Met MOS Career Guide, Jun
Aerial Fire Support Observers Needed (RN), Oct
Airborne FA NCOs Needed (VB), Oct
AOE Force Structure and CONOPS, Oct
Article 15s and Promotions (RN), Oct
Continuous Operations and the Human Dimension (OM), Oct
The End Of The Pershing Era: The INF Treaty, Oct
FA Not Promoting Enough NCOs (RN), Oct
"No Slack" — A Blueprint for Combat Excellence, Oct
The TOE and The Personnel Cap (RN), Oct
Warrant Officer 132A (201A) MOS Update (VB), Oct
Field Artillery Assignments Branches, Dec
Field Artillery Training and Development Challenges, An interview with General Maxwell R. Thurman, TRADOC Commander, Dec

"On the Move"

Live to Defeat the Enemy, Apr
Synchronization on the AirLand Battlefield, Jun
Truth in History, Aug
Continuous Operations and the Human Dimension, Oct

Research and Development

Redlegs in Acquisition, Apr
Survivable Hardware Coming? You Can Bet On It!, Apr
Multi-Dimensional Concepts: The Force Multiplier for Future Battlefields, Jun
Field Artillery State-of-the-Branch Address, Dec
Field Artillery Training and Development Challenges, An interview with General Maxwell R. Thurman, TRADOC Commander, Dec

Tactics and Strategy

After Grenada: Joint Operations in the 82d Airborne Division, Feb
Certain Strike: REFORGER 87, An Artillery Overview, Feb
JAAT Planning: Getting the Most from Synchronized Forces, Feb
JOINT STARS Looks Deep to Win, Feb
A NATO Primer on Battlefield Air Interdiction, Feb
RPV: Above the Threat, Feb
The Counterfire Battle: The Missing Element in Today's Training, Apr
Electronic Warfare: Sudden Death, Apr
Increasing Survivability of Firefinder Radars, Apr
Light Fighter Battery Defense, Apr
Live to Defeat the Enemy (OM), Apr
Shakin' the Cities (Occupying urban terrain), Apr
Fire Support in Mobile Armored Warfare, Jun
The Flying Box: Supporting the Mobile Armored Corps, Jun
Multi-Dimensional Concepts: The Force Multiplier for Future Battlefields, Jun
Synchronization on the AirLand Battlefield (OM), Jun
TOPFORM: 3x8 Tactical Operations, Jun
The Key to Field Artillery — Focusing Combat Power, An interview with General Crosbie E. Saint, CINCUSAREUR, Oct
The Key to Firefinder Survivability (INC), Oct
A Practical Approach to CONOPS, Oct
OH58D: The New Eye On the Battlefield (RP), Oct
Response to Light Fighter Battery Defense (INC), Oct

Target Acquisition

Document MTOES Before Receiving SEDME-MR (VB), Feb
Increasing Survivability of Firefinder Radars, Apr
PADS Versus Conventional Accuracies (VB), Apr
Field Artillery Restructures Survey Sections (VB), Jun
The Key to Firefinder Survivability (INC), Oct

Threat

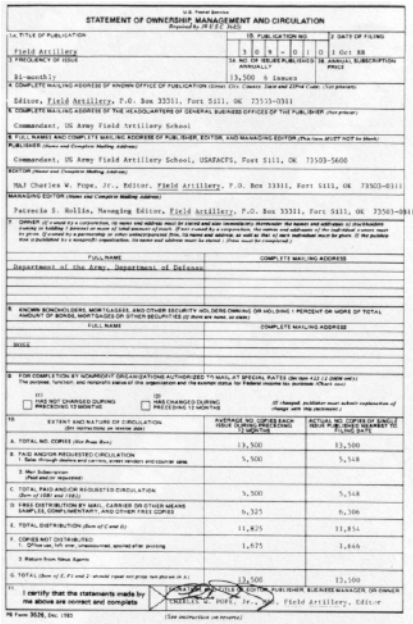
Another Soviet Artillery System Goes Self-propelled (RN), Jun
The Evolution of Soviet Fire Support, 1940-1988, Jun
KTD1, The New Soviet Laser Rangefinder (RN), Jun
Soviets Revive Heavy Artillery Formations (RN), Aug
The End Of The Pershing Era: The INF Treaty, Oct
The Soviet BM21V Grad-P, (RN) Oct
Soviet INF Inspections, Oct

Training

Certain Strike: REFORGER 87, An Artillery Overview, Feb
III Corps Redlegs on REFORGER, Feb
The Counterfire Battle: The Missing Element in Today's Training, Apr
Observed Fire Training. Is it Good Enough? (INC), Apr
Redlegs Fit to Fight, Apr
SQT References (VB), Apr
GTA Safety Hazard (VB), Jun
Fire Coordination Exercises (INC), Jun
Fire the Prep: Some Thoughts About Direct Support, Jun
Military Officer Qualification Standards (VB), Jun
NTC Trends (INC) Jun
Operations at the JRTC: Fire Support Issues, Jun
PADS as a Moving Target Simulator (FRAG), Jun
Reconfiguration of Field Artillery Publications (VB), Jun
TSFO Operator Training (VB), Jun
BATTLEKING: M197 Direct-Fire Training Device (VB), Oct
Battery CONOPS Training: "How to" in a Light Infantry Division, Oct
M113 Unsafe for Amphibious Training (RN), Oct
Education: One Key to NCO Development, An interview with Command Sergeant Major David T. Taylor, Fort Sill, Oklahoma, Dec
Field Artillery Training and Development Challenges, An Interview with General Maxwell R. Thurman, TRADOC Commander, Dec
Innovative Fire Support Training—The Time is Now!, Dec
NTC: Fire Support Trends and Fixes, Dec

Unit Reports

Airborne Redlegs-1-39th FA (RP), Oct
The 59th Ordnance Brigade—A vital Link in the NATO Alliance, Feb
Italian Mountain Artillery (FRAG), Feb
Field Artillery Commanders and Command Sergeants Major, Dec
Field Artillery Units Worldwide, Maps, Dec
Silhouettes of Steel, Reports by Army Corps and Division Artilleries and Marines, Dec



STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

1A. TITLE OF PUBLICATION	1B. PUBLICATION NO.	2. DATE OF FILING
Field Artillery	3 0 9 - 0 1 0	1 Oct 88
3. FREQUENCY OF ISSUE	3A. NO. OF ISSUES PUBLISHED ANNUALLY	3B. ANNUAL SUBSCRIPTION PRICE
Bi-monthly	13,500 6 issues	

4. COMPLETE MAILING ADDRESS OF KNOWN OFFICE OF PUBLICATION (Street, City, County, State and ZIP+4 Code) (Not printers)

Editor, Field Artillery, P.O. Box 33311, Fort Sill, OK 73503-0311

5. COMPLETE MAILING ADDRESS OF THE HEADQUARTERS OF GENERAL BUSINESS OFFICES OF THE PUBLISHER (Not printer)

Commandant, US Army Field Artillery School

6. FULL NAMES AND COMPLETE MAILING ADDRESS OF PUBLISHER, EDITOR, AND MANAGING EDITOR (Do not leave BLANK)

PUBLISHER (Name and Complete Mailing Address)

Commandant, US Army Field Artillery School, USAFACFS, Fort Sill, OK 73503-5600

EDITOR (Name and Complete Mailing Address)

MAJ Charles W. Pope, Jr., Editor, Field Artillery, P.O. Box 33311, Fort Sill, OK 73503-0311

MANAGING EDITOR (Name and Complete Mailing Address)

Patricia S. Hollis, Managing Editor, Field Artillery, P.O. Box 33311, Fort Sill, OK 73503-0311

7. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.)

FULL NAME	COMPLETE MAILING ADDRESS
Department of the Army, Department of Defense	

8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state)

FULL NAME	COMPLETE MAILING ADDRESS
NONE	

9. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES (Section 423.12 DMM only)

The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes: (Check one)

(1) ☐ HAS NOT CHANGED DURING PRECEDING 12 MONTHS (2) ☐ HAS CHANGED DURING PRECEDING 12 MONTHS (If changed, publisher must submit explanation of change with this statement.)

10. EXTENT AND NATURE OF CIRCULATION (See instructions on reverse side)	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NO. COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
A. TOTAL NO. COPIES (Net Press Run)	13,500	13,500
B. PAID AND/OR REQUESTED CIRCULATION 1. Sales through dealers and carriers, street vendors and counter sales	5,500	5,548
2. Mail Subscription (Paid and/or requested)		
C. TOTAL PAID AND/OR REQUESTED CIRCULATION (Sum of 10B1 and 10B2)	5,500	5,548
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES	6,325	6,306
E. TOTAL DISTRIBUTION (Sum of C and D)	11,825	11,854
F. COPIES NOT DISTRIBUTED 1. Office use, left over, unaccounted, spoiled after printing	1,675	1,646
2. Return from News Agents		
G. TOTAL (Sum of E, F1 and 2 - should equal net press run given in A)	13,500	13,500

11. I certify that the statements made by me above are correct and complete

[signature] CHARLES W. POPE, JR., MAJ, FA, EDITOR, PUBLISHER, BUSINESS MANAGER, OR OWNER Field Artillery, Editor

PS Form 3526, Dec. 1985 (See instructions on reverse)