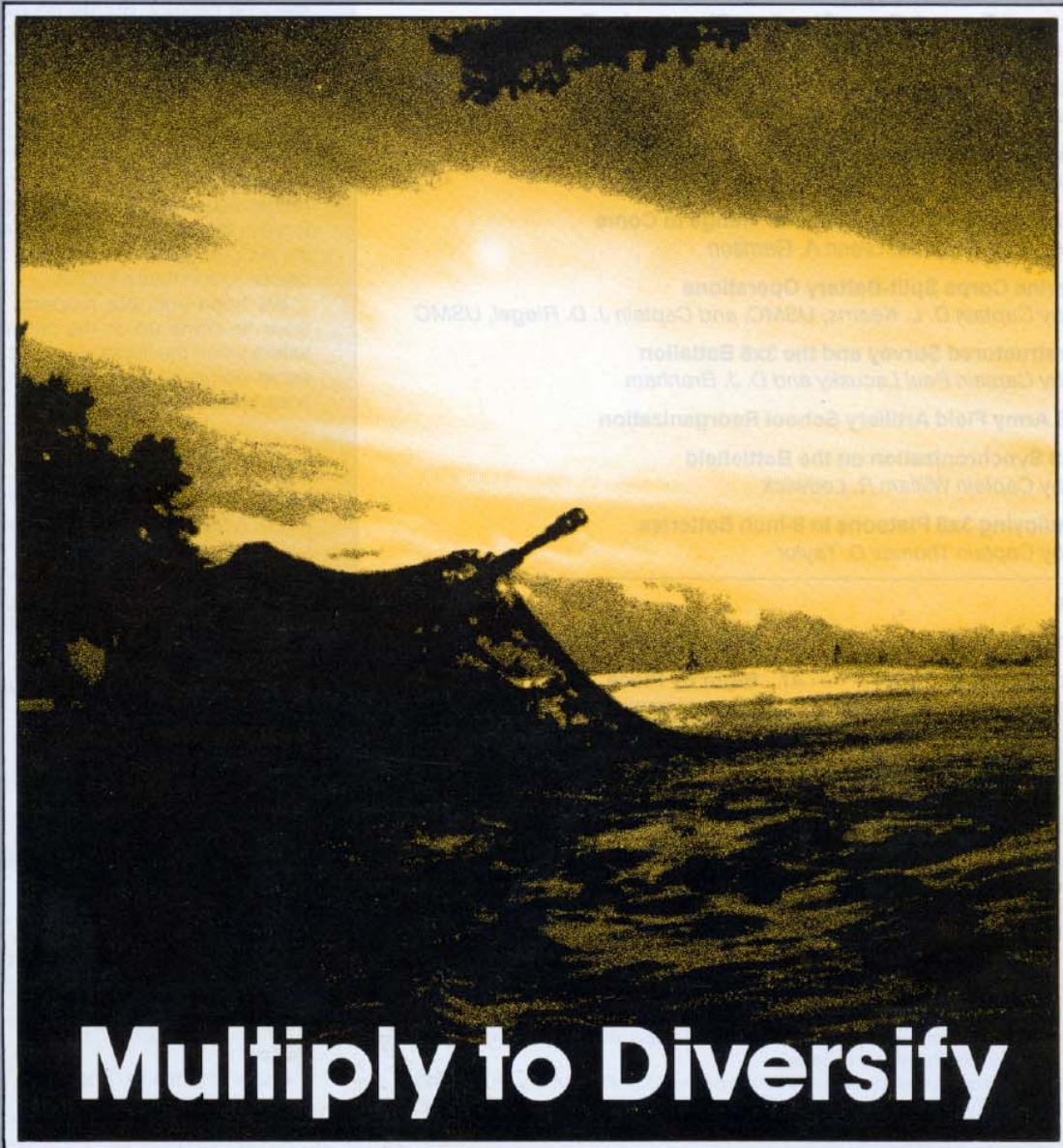




Field Artillery

A Professional Bulletin for Redlegs

February 1989



Multiply to Diversify



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HQDA PB6-89-1

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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 2 years and \$46.00 for 3 years) to US and APO addresses. All other addresses should add \$9.00 per subscription year for postage.

SUBMISSIONS: All letters and articles should be addressed 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.

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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.

FM 3x8

Though *Field Artillery* is not a doctrinal publication, my title Field Manual (FM) 3x8 best captures the "how to" thrust of the content of this edition. The articles include the perspectives of different levels of command, different calibers of weapons, the Marine Corps and Army units located worldwide. As always, the similarities and differences in approach to implementing the 3x8 doctrine offer much food for thought. The information these articles provide about tactics, command and control, reconnaissance and logistics may suggest ways to modify not only tactical employment doctrine, but also force structure as we move toward the 21st century. But an equally important function these thoughtful writings serve is to allow us to start to share these good ideas *right now*.

We are indebted to FORSCOM Commander General Joseph T. Palastra, Jr. for sharing his thoughts about the importance of training as we'll fight and, as the maneuver commander of the largest force in the US Army, his confidence that the King of Battle will continue to play a crucial role in future battles.

We hope you, our readers, will continue "to come up on the net" with your letters when the ideas you read here deserve comment—pro or con. This is *your* professional forum.

Editor

Field Artillery Hotlines

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On the Move

MAJOR GENERAL RAPHAEL J. HALLADA



3x8: Our Force Multiplier

In the next war, our Army could face an enemy who outnumbers us by as much as three to one in tanks and seven to one in Field Artillery. To win in such an environment, our joint and combined-arms team must take advantage of every combat multiplier. Our 3x8 Field Artillery is a key force multiplier, and it's available now. It entails no additional research and development costs and doesn't require new systems technology. What it does entail is organizing our available resources better for war-fighting.

The Concept

The 1979 "Legal Mix V" study validated the 3x8 concept. We began up-gunning firing batteries from six to eight guns, adding another fire direction center (FDC) and incorporating "pure" platoon tactics in 1985.

The 3x8 battery organization operates with two independent, four-gun firing platoons, both capable of autonomous split-battery operations. The support elements of the battery form a battery train, which can either collocate with one of the platoons or stay within supporting distance of both platoons.

NATO artillery is outnumbered, outgunned; such that we may lose many of the advantages of the defender.

General Glenn K. Otis
As Commander, US Army, Europe
7 October 1987

The Fundamentals

The concept of 3x8 operations emphasizes the five fundamentals of fire support in the AirLand Battle: flexibility, responsiveness, mobility, survivability and massed fires.

Flexibility and Responsiveness. Doubling the number of available firing units increases fire support flexibility. The commander has a greater choice of firing units to select from, based on their current location on the battlefield, availability to fire and ammunition loads. Moreover, having six separate firing units per battalion to call on, each with its own FDC, increases the Field Artillery's responsiveness. The commander can now influence the battle more quickly and attack more targets.

Mobility. Mobility also is enhanced by the conversion to 3x8 operations. Increasing the number of firing units allows movement by platoons, thus ensuring more guns of the battalion are available to fire at any given time. In addition, the firing-unit design inherent in 3x8 organizations makes the units "pure shooters," with no administrative or support vehicles slowing the battery's combat movement. These features, along with "leapfrog" movement techniques, facilitate quicker displacements and increase the time batteries are available to fire.

Survivability. The firing units are more survivable by virtue of their smaller size and the corresponding footprint they portray to enemy target acquisition and counterfire assets. Split-battery operations make it more difficult for the enemy to acquire and attack these smaller units.

Massing Fires. Another feature of 3x8 battalions, with their additional

fire direction capabilities, is they can easily tailor, lift, shift and mass fires. And with the additional howitzers, we achieve a 33 percent increase in the killing power of the munitions fired during massed fire missions. The increase in tubes and speed of fire direction computers make the massing of fires more lethal than ever before.


The Future

The transition of the firing battery from a fixed firing unit to split-battery operations is a major step toward autonomous firing operations. The next phase of this effort is the M109 howitzer improvement program (HIP), which currently is undergoing testing at Fort Sill. With the HIP we're producing a system capable of semiautonomous firing operations.

On the horizon, we expect to field the advanced Field Artillery system (AFAS) as part of the Armored Family of Vehicles (AFV) program. The AFAS should arrive in the field around the year 2000, giving us a fully autonomous cannon system. Our movement toward autonomous operations is a major advancement in our own survivability and enhanced responsiveness to the committed maneuver forces.

The Bottom Line

In summary, for the cost of six additional gun crews and a few major items of equipment, the maneuver commander gets a one-third increase in firepower to fight the close battle. No new elaborate headquarters overhead or organizational structure must be added. The doctrine is here and viable. All we need is the equipment.

To date, the only holdup in converting all Active Component battalions to 3x8 has been the lack of certain items of equipment, such as the M548 ammunition carrier, FM radios and, until very recently, the battery computer system (BCS). Unfortunately, the scarcity of this equipment has once again forced us to slow the conversion of our units to 3x8 operations. We're pushing to keep this key fire support program moving. 

Incoming

LETTERS TO THE EDITOR

SAFETY: OH58D Can't Provide Accurate Enough Survey Control

In an article concerning the OH58D navigation system's capability in the October 1988 issue of *Field Artillery* ["OH58D: The New Eye on the Battlefield" by Second Lieutenants Adam P. Oaks and Kenneth D. Seiffert, Jr. and First Lieutenant B. Shawn Vishneski], the authors suggest the OH58D, using its navigational system, can provide an eight-digit coordinate as a survey point for the artillery battery. In my opinion, this is a very misleading statement. It gives the impression the ground-position accuracy derived by the OH58D is accurate to the nearest 10 meters. The OH58D has an excellent means of target acquisition and targeting through its mast-mounted sight (MMS) and airborne target handover system (ATHS); however, it's questionable it can provide survey control to howitzers within the prescribed survey accuracy. Consider these facts:

a. The Army Position and Navigation (POS/NAV) Master Plan, the Standardization Agreement (STANAG 2373) and the Quadripartite Standardization Agreement (QSTAG 269) stipulate the required accuracy for howitzer position must be within 18 meters circular error probable (M-CEP) to achieve a first-round hit on a target.

b. For the OH58D navigation system to process an accurate location and altitude of a target, it first must be initialized over a survey control point and, thereafter, updated again over a survey control point every 15 nautical miles or 15 minutes of flight.

c. According to the White Paper, "Employment of the OH58D System in the Field Artillery Role" and the proposed ST

6-30-40 *Employment of the Aerial Fire Support Team*, a special text, the required accuracy of the initialization or update point is 25 meters CEP.

d. As the OH58D flies from its initialization or update point to its destination, its navigation system—the attitude heading reference set (AHRS) and the AN/ASN-137 doppler—is expected to drift from its true course by 6 meters for every kilometer of distance flown.

e. The OH58D usually will use its laser rangefinder to extend the eight-digit grid from the AHRS to the target. The accuracy of the laser rangefinder is 5 meters. Keep in mind, however, that the eight-digit grid doesn't indicate an accuracy of 10 meters; it is a read-out capability only.

Using the following example, you can approximate the accuracy that you can achieve with the OH58D system.

Example:

Required Survey Accuracy for Howitzers	= 18 Meters CEP
Survey Initialization of OH58D	= 25 Meters (CEP)
Distance Flown to Target	
10 Kilometers (6 Meters per Kilometer)	= 60 Meters
Laser Rangefinder Accuracy	= 5 Meters



MAJ Bruce A Woolman

From this example, it's readily apparent the OH58D navigational system can't satisfy the 18 meters (CEP) requirement for a howitzer's location, and it should be used only as a last resort when you can't achieve survey by PADS [position and azimuth determining system], conventional surveys or hasty surveys. Should the OH58D actually be used for providing coordinates for howitzers, commanders must realize common survey control, massing of fires, first-round hit on targets or conducting unobserved fire may not be possible.

Frank Brown
Target Acquisition Department
Field Artillery School

SAFETY: Response to "Lasers: Direct-Fire Weapons For and Against Us"



I refer to Captain William J. Spencer's article: "Lasers: Direct-Fire Weapons for and Against Us" (June 1988). To qualify

my remarks, I am Project Engineer for Low-Power Lasers and Countersurveillance Systems with the US Army Materiel Test and Evaluation Directorate at White Sands Missile Range [New Mexico].

Captain Spencer's article is interesting and very understandable. However, the article offers some potentially hazardous laser safety measures that need clarification. He and I discussed the following points in late June concerning laser safety countermeasures for vision blocks and direct-view optics that provide magnification (binoculars, gunner's sights, telescopes, etc.) and that have a direct, unfiltered light path from the source to the eye.

Foremost, all tactical lasers (designators, rangefinders, survey devices, etc.) in the inventory and those under test are not eye-safe for several kilometers, even if one can't "see" the laser beam. The most common wave length for tactical lasers (ours and theirs) is 1.06 micrometers (near infrared), which is band passed and focused by the eye even if it isn't detected (or "seen") by the retina. Any laser connected to a power source is as dangerous as a loaded M-16 and must be treated with the same respect. Neither is a toy and neither should be operated by untrained personnel.

I agree with Captain Spencer that creating a vision slit with tape on vision blocks

significantly reduces the entry aperture for incident laser energy by reducing the likelihood of directly viewing the beam. But a three-millimeter slit doesn't necessarily equate to an overall 25 percent reduction of incident laser energy. Consider also that the pupil of the human eye is two to three millimeters in daylight and six to eight millimeters at night. The advantage of the slit comes from reducing the field of view for off-axis illumination of the eye (e.g., the laser must be directly viewable from behind the slit to be a hazard).

"Sacrificial glass" to protect the optic offers false security to the operator when the eye is the weak link. Common window glass (the most likely field expedient) will pass all wave lengths (some more than others) from ultraviolet through visible and into infrared. Consider that most tactical applications involve Class 3 lasers, which can produce instantaneous eye damage if directly viewed. In comparison, the Class 2 lasers used for grocery store checkout are "eye-safe," if one doesn't stare (inhibit

natural blink reflex) into the beam or doesn't view the light with a magnifying optic.

Neither a Class 2 nor Class 3 laser produces sufficient energy to craze or damage glass, but they can certainly cause eye damage. A laser with enough energy to craze glass (Class 4) will also burn exposed skin, ignite clothing and damage the unprotected eye.

My real problem with the article lies with the statement "...placing tape with a pinhole in it over one lens of each pair of binoculars." If one uses this method, *tape both objective lenses (not the eyepieces) and pinhole only one lens*. The effect of the pinhole is to reduce the field of view and to attenuate the amount of light passing through the lens. The reason for one pinhole is the difficulty of establishing binocular vision with two, very narrow fields of view. The reason for favoring the objective is that the amount of light passed is in the same ratio as the diameters squared (e.g. a 1-mm hole over a 10-mm eyepiece will pass

1/100th of incident light, while a 1-mm hole over a 50-mm objective will pass 1/2500th of incident light). Additionally, taping the eyepieces might produce some effects I can't discuss in this forum.

Even with such estimated attenuation, focusing the human eye can allow very dangerous concentrations of laser light on the retina. This is why properly matched laser eye protection is worn during laboratory and field testing. Taping vision blocks and pinholing direct-view optics are field expedients that may offer some protection. In a laser environment, the real tricks are—first, to avoid direct viewing of lasers, and second, to use a minimum of direct-view magnification optics.

The US Army is retrofitting many optical systems with laser-hardening features that will protect the operator.

Charles D. Revie
Project Engineer
Army Materiel Test & Eval
White Sands, NM

BCS-ITS: How Do I Get One?

In the December 1987 issue of *Field Artillery*, the article "Major Field Artillery Weapons and Support Systems" mentioned a recently developed piece of equipment called the battery computer system interface training simulator (BCS-ITS). The article stated the BCS-ITS uses prerecorded lesson tapes along with manuals to exercise interoperability skills.

I am currently a fire direction center (FDC) chief of section in a 155-mm self-propelled howitzer battery in Europe, so I was very excited to learn such a valuable training aid existed. I have contacted numerous BCS and TACFIRE [tactical fire direction system] schools in my area as well as Logistics Assistance at USAREUR [United States Army, Europe], but no one has heard of the BCS-ITS.

Can you give me more information about the BCS-ITS trainer? The BCS-ITS would improve our unit readiness dramatically through sound, comprehensive training, which we currently find difficult because of the constant manpower, machinery and time constraints placed on a unit in a garrison environment.

David T. Starr
SSG, FA
B Btry, FDC Chief
2-1 FA

BCS-ITS: Here's How You Get One!

Unit-level training is one of the greatest responsibilities of a unit commander. It also can be one of his toughest challenges. This is particularly true for artillery units equipped with Field Artillery tactical data systems. Developing and maintaining proficiency in the TACFIRE system requires massive coordination to bring all the battalion's devices—TACFIRE, variable format message entry device (VFMED), digital message device (DMD) and BCS—on line to conduct training. Until now, doing so was the only way to train the battalion's elements to interoperate successfully as they would in combat.

The BCS-ITS is a US Army Field Artillery School (USAFAS)-developed training device designed to provide tactical data system training for BCS-GDU (gun display unit) or Lance-MLRS (multiple launch rocket system) fire direction system

(FDS) operators. The BCS-ITS provides the means to conduct system-level training at battery level without requiring the other system devices to be on line. It does this by simulating digital message traffic that usually comes from other digital devices in the battalion.

It uses prerecorded lesson tapes along with lesson manuals to exercise interoperability skills. The operator merely connects the BCS-ITS to the BCS-FDS-GDU with WD-1 communications wire, loads the appropriate lesson tape and performs the situational requirements outlined in the lesson text. The BCS-ITS begins transmitting a series of digital messages to the BCS-FDS-GDU that prompts the operator to perform the required action to process the message. The BCS-ITS also acknowledges messages transmitted by the

BCS-FDS-GDU. The trainer (section chief) has a corresponding instructors manual to let him evaluate and help the soldier.

The BCS-ITS hardware is a field-hardened, computer-controlled tape playback unit. It weighs 31 pounds and is transportable in its own packing case. The BCS-ITS training packets include instructors manuals, student manuals, lesson tapes and the technical manual (TM-11-6940-215-10) for the BCS-ITS itself. The lessons come in two versions: a CONUS data-base lesson package and an OCONUS data-base lesson package. Cannon and Lance units will receive an initial issue of a CONUS and OCONUS scenario. MLRS units will receive one CONUS scenario. There is a second OCONUS data base under development for cannon, Lance and MLRS units.

Initial issue of the BCS-ITS will include the training package for the Cannon, Lance or MLRS unit. The BCS cannon lessons are part number 250-061-6300-R; Lance FDS lessons are part number 250-061-6600-R; and MLRS FDS lessons are part number 250-061-6500-R. To order manuals, use these same part numbers and change the letter suffix. Instructors manuals have the suffix Y and the operator manuals suffix V.

Fielding of the BCS-ITS is by forced issue through local training and audiovisual

support centers (TASCs). Currently, Tobyhanna Army Depot is assembling the BCS-ITS and is shipping them to the local TASCs for distribution to their supported units. Shipments began in June 1988. The BCS-ITS basis of issue is one per authorized BCS or FDS. In addition, we're expanding the basis-of-issue plan (BOIP) to include FA brigade, division artillery and corps artillery headquarters. The basis of issue will be one BCS-ITS per organization.

These TASCs also serve as the issue and

turn-in points for organizational maintenance (limited to changing bulbs and fuzes). Tobyhanna Army Depot will provide any additional maintenance. TASCs will have a 10-percent float factor to support the maintenance effort.

Joe D. Jenkins
SFC, FA

*Fire Support and Combined
Arms Operations Department
Field Artillery School*

Mortars—A Field Artillery Weapon

In the "View From the Blockhouse" (October 1987), the "CALL Corner" had a timely article concerning lessons learned about mortars. It stated, "A current fire support issue is the ineffective use of battalion and company mortars." I submit that we can solve the continuing problem of ineffective use of mortars by consolidating mortars as Field Artillery assets and grouping them in Field Artillery units.

The mission of the Field Artillery is to provide responsive fires to the maneuver forces using all indirect-fire support systems. Sometimes this is easier said than done, primarily because one of the main indirect-fire support systems, the mortars, doesn't belong to the Field Artillery but to the Infantry and Armor. At the risk of offending our maneuver brethren, this is like an artilleryman's having responsibility for employing a Bradley or an M-1 tank. I propose mortars become a Field Artillery asset and think the result would be improved doctrine, training and, most important, improved fire support for the maneuver commander.

In the area of doctrine, as "CALL Corner" pointed out, mortars aren't well-used, particularly at the National Training Center. They simply are not integrated into the fire support plan. Given the concept of Airland Battle, this situation is potentially fatal. A fluid battlefield and the need to plan adequate fire support for the deep battle, the close-in battle and the rear battle, as well as for security forces (cavalry) and reserves, calls for centralized control of the assets to execute the plan. Current doctrine doesn't allow this. The reason, I believe, lies in the fact that doctrine for mortar employment is developed at Fort Benning, Georgia, in a virtual vacuum from the Field Artillery Center. Consolidation of mortars as Field Artillery assets would allow the Field Artillery Center to more thoroughly define the doctrine of mortar employment in relation to Field Artillery.

An offshoot of this doctrine could be the development of guidelines for suitable targets for mortars and cannon artillery. For example, cannon units could service medium- and long-range targets to support the deep battle. They could attack command and control centers, supply areas, air defense artillery sites and Field Artillery positions at medium and long range, as well as target groups in the fire plan. Mortars, on the other hand, would handle much of the close-in fight against short-range "soft" targets, such as dismounted infantry and "soft-skinned" vehicles. Mortars could be used for a majority of the smoke missions, marking Air Force targets and short-range suppressive fires.

A key point, however, is the fact that the fire support system requires discipline—the execution of a fire plan based on named areas of interest (NAI) and target areas of interest (TAI). We can't afford the luxury of chasing targets of opportunity all over

the battlefield, to the exclusion of our fire plan. The Field Artillery Center could develop guidelines for employing mortars and cannon artillery that would provide for the disciplined attack of the enemy in established target areas and still enable mortars to be responsive to attack targets of opportunity. This doctrine can't be firmly established now because there are two separate schools involved. Consolidation would solve this.

As stated before, mortars aren't integrated into fire support plans well. This is a function of inadequate training. This inadequate training isn't surprising, given that the employment of mortars isn't a central part of a maneuver commander's METL [mission-essential task list]. Indeed, in many units, Field Artillery personnel are called upon by maneuver commanders to provide instruction to mortar personnel. Likewise, mortars aren't well-integrated into fire support plans because they



The Field Artillery Center can train mortarmen—MOS 13—in a standardized manner.

aren't integrated into fire support officer (FIST/FSO) training until an NTC rotation or some other high-visibility operation occurs.

Move mortars to the Field Artillery. The Field Artillery Center can train mortarmen—MOS 13—in a standardized manner. Field Artillery lieutenants can be trained as mortar platoon leaders rather than relying on the Infantry School to give secondary training, which is in no way standardized with Field Artillery training or doctrine, to non-artillery lieutenants. The result will be fire support training, in its totality, integrated into OBC, OAC and NCOES courses. Instruction on all Field Artillery resources, mortars through 8-inch howitzers, TACFIRE [tactical fire direction system] and target acquisition assets will be presented in fire support training under standardized tasks, conditions and standards.

A related issue is the fielding of the mortar equivalent of BCS [battery computer system]. New equipment fielding and training for this system would, I believe, be much smoother if it originated at Fort Sill, which has experience in training soldiers to use and integrate this type of equipment into TACFIRE.

Could the Field Artillery Center handle such training? The 1978 "Mortars Studies" finalized by General (Retired) Jack N. Merritt, formerly of the Field Artillery School, concluded that it could. Though the study didn't suggest we consolidate mortars

under Field Artillery, it clearly stated Fort Sill could handle the training. Lieutenant General (Retired) David E. Ott had stated earlier in April 1976, "Our recommendation and mine is that we...work out a program establishing an artillery MOS for mortarmen trained at Fort Sill."

Consolidation of mortars into the Field Artillery would result in increased indirect-fire support as well. It would allow the formation of mortar units (e.g., mortar battalions in the division artillery).

The concept of mortar units is not new. Soviet motorized rifle divisions currently have mortar batteries, while the American Army FM 6-18 outlines operations of mortar batteries in support of the old airborne division battle groups. Consolidation would enable the division artillery commander to task organize all his fire support assets to meet the tactical situation, something he can't currently do.

Because the mortars "belong" to the maneuver unit (battalion commander), there is no flexibility. Thus, if the division artillery commander wants to make responsive firepower more readily available for special missions (e.g., a cavalry squadron guarding a flank), he has no recourse but to task the artillery. Consolidation would enable him to *task organize* multiple mortar units from the division artillery to meet this need.

The point to be made is mortars are a valuable asset. Their use should be based on the factors of METT-T [mission, enemy,

terrain, troops and time available]. They should not sit idle in a quiet portion of the battlefield simply because they "belong" to the maneuver commander.

More importantly, consolidation would allow mortars to be available for fire support at all times. Under the current system, when a maneuver unit is placed in reserve, the mortars are placed in reserve also. This results in valuable firepower's being lost. This fact, of course, violates the tenet of never placing artillery in reserve. Failure to consolidate mortars under the artillery results in the division commander's being deprived of the ability to make the most efficient use of all fire support assets to synchronize the Airland Battle and to provide support for the various portions of the battlefield.

So, my argument is a simple one. Mortars are an indirect fire support asset. As such, the Field Artillery, not the Infantry or the Armor, should be responsible for developing the employment doctrine, training personnel and, most importantly, directing when, where and how they will be used. The result will be a more efficient, cohesive and effective fire support operation.

James O. Harrison III
MAJ, FA
XO, 3-3 FA
Fort Hood, TX

Response to the June Edition

As in most *Field Artillery* issues, the [June 1988] letters to the editor ["Incoming"] section once again provides a forum for useful and provocative dialogue between the School and the field. Captain Steven A. Stebbins' letter on the importance of "Fire Support Coordination Exercises" recognizes the need to train in a combined-arms environment as frequently as possible. Integration of the close-in fire support systems of helicopter gunships, tactical air, artillery and mortars to support the maneuver commander places great demands on our young officers. We have found this training to be invaluable and schedule an FCX for each infantry battalion just before they deploy to our Air Ground Training Center at 29 Palms, California.

"Fire Support in Mobile Armored War-are" by Lieutenant General Crosby E. Saint [now General], Colonel Tommy R. Franks and Major Alan B. Moon is another article of immense value. Their point that fire support must be focused at critical

points *and* critical times is essential to success on the battlefield. This article ties in the criticality of IPB [intelligence preparation of the battlefield] and target-value analysis.

However, the thoughts on "Storm Artillery" need amplification. They talk about artillery "moving tactically within maneuver formations" and occupying emergency positions to "provide fires 3,000 to 4,000 meters to the front and flanks, adjusting later." This idea surfaces logistical and tactical challenges that are unnecessary, especially since we now have weapons with ranges that allow artillery to "maneuver with fires" in support of the ground scheme of maneuver.

"Fire the Prep: Some Thoughts About Direct Support" [by Colonels R. S. Ballagh, Jr., Floyd J. (Buck) Walters (now Brigadier General), IN, and Leonard D. Miller] is right on target. We must have the best available artillerymen assigned as fire support officers. Our FSOs must be in the "hip pockets" of their maneuver bosses at

each command level and truly understand the commander's intent. This is difficult if the FSO changes on a frequent basis. Too often we give this critical position short shrift, which certainly gives the maneuver commander reason to question our dedication to his plan of action.

I suggest our magazine continue to focus on combat in Europe. But there are some very possible contingencies that would fall more in the low- to mid-intensity level of combat. Therefore, I'd like to see a call for articles oriented toward the challenges of providing artillery support to maneuver forces in a Central-American scenario. As artillerymen, we must not lose sight of the difficulties of fire support in a jungle environment with limited interior lines of communication.

As you would imagine, there's no way I could close without commenting on "Red-leg Leathernecks and the Medal of Honor." As Major David T. Zabecki noted, a constant thread in the saga of bravery surrounding the actions of those artillerymen who

won our nation's highest award for military valor was their willingness to fight as infantrymen when the need arose. Taking command in times of crises, they defended their positions against tremendous odds. We must strive to ensure our training does not fall short in preparing our Marines and soldiers to meet the challenges of our next great battle.

Perhaps the June issue, dedicated to support of maneuver forces, will stimulate more articles that analyze maneuver and fire support relationships.

E.A. Smith
LtCol, USMC
Cdr
10th Mar Regt
Camp Lejeune, NC

Response to "The Key to Firefinder Survivability"

I welcomed the response to my article ("Increasing Survivability of Firefinder Radars," April 1988) in the letter to the editor by CW3(P) Gordon M. Baxendale ["The Key to Firefinder Survivability," October 1988]. I was especially happy to see my article generate a response written by a fellow warrant officer. Unfortunately, this has not happened frequently in recent years.

Although I found Mr. Baxendale's letter interesting, I would like to comment on some inconsistencies in the information it contained.

First, I would like to remind Mr. Baxendale that the two-minute cumulative radiation and subsequent march-order issue was not my concept. This "rule" has been guidance briefed at the Target Acquisition Department (TAD) [Field Artillery School] long before my arrival. It's based on the information contained in research and analysis publications produced by the TRADOC [Training and Doctrine Command] System Manager (TSM)-Threat. The base document is the classified "Systems Threat Analysis for Radar" (STAR) published in 1985 or 1986. This document has been mentioned at every briefing I've attended presented by the TSM-Target Acquisition (TA) about Firefinder radars and their vulnerability. The specifications that guided the research and development of the Firefinder II project were based on the inconsistencies of current system emplacement and march-order time and the data detailed in the STAR. I would like to remind Mr. Baxendale the two-minute threat capability is still valid.

Mr. Baxendale contends both howitzers and radars "must be stationary" to provide the support required. He continues by suggesting "we shouldn't base radar survivability on the shoot and scoot tactics..." If there's no need for the radars to be responsive and mobile for the fluid conditions of the modern battlefield, then why all the interest in the development of Firefinder II?

I totally agree with Mr. Baxendale that situational cueing is more advantageous

than a random schedule. However, he would have us believe our field units are masters of the command and control of Firefinder radars. Firefinder radars and their crew members have been the victims of misuse since their fielding. To date, the loudest complaint from the field radar community is that Firefinders continue to be used to provide range safety during live-fire training.

One of my early letters to the editor ("Firefinder Misused," January 1985) detailed the problems that continue today. It's rare that an S3 gives the specific direction concerning employment, communication, cueing and targeting criteria listed by the author. The division artillery commander may hear the most reassuring pre-deployment briefing outlining the training plan for Firefinder during the unit's training cycle, but it just doesn't materialize on the ground. This false sense of security is the most serious of issues. To continue to pretend or assume targeting doctrine is practiced at every level is dangerous.

Who will have the authority to cue the radar is a critical consideration. Recent history has taught our Armed Forces a painful lesson in what happens to individuals during combat. The heat of battle fosters confusion, anxiety and fear. These characteristics translate into inappropriate actions. I would contend that any agency in communication with a Firefinder on the battlefield would request (or demand) its services. With the FOs [forward observers], AOs [aerial observers], FSOs [fire support officers] and TOCs [tactical operations centers] all using Firefinder, any cueing doctrine would be ignored.

Only those skills practiced through repetition are performed automatically in combat. We need to stop using terms (like commander's target criteria, target-value analysis and intelligence estimates) as buzz words and begin defining the tasks and objectives of our field training.

Specific operational command and control guidance must become second nature in the entire Field Artillery community. One



We must evaluate Firefinder radar sections with their maneuver battalions.

way of realizing this goal is to evaluate radar sections with the maneuver battalions they support. Give radar employment and operations the same importance and interest as first aid or NBC [nuclear, biological and chemical] training during *external* evaluations.

About the questions of doctrine, I would suggest Mr. Baxendale research the draft copy of the *ST 6-121-30 Light Division Target Acquisition* [a special text]. Representatives of each light division and members of TAD wrote and produced this document. The questions of METT-T [mission, enemy, terrain, troops and time available], cueing and detailed employment practices

(to include a threat matrix) are addressed for both light and heavy divisions. Professional soldiers have always based their tactical decisions on METT-T. It's the innovative leader who looks beyond the fundamentals and considers all the factors that will affect his mission, whether they're listed in a reference manual or not.

The random-cueing schedule concept I explained in my article was researched and tested to determine how much was gained by using the less acceptable of the two methods. Using a faster Pascal version of the random schedule, a four-hour FEM [field exercise mode] training program for operators was developed to simulate the

first hours of battle in a USAREUR [United States Army, Europe] environment. Seventy-four percent of all "hot" locations were located. The simulation concept was extended to a live-fire exercise corresponding with a 1st Armored and 41st Brigade density at Grafenwoehr. Using only the schedule and two systems (one Q-36 and one Q-37), 80 percent of the "wet" position areas were detected.

Don't misunderstand the reason for detailing the information in the preceding paragraph. I'm not suggesting (and never have) that random cueing is the best or only method to use. It is only the product of inquisitive minds trying to apply the technology

available to provide solutions. Obviously, the *best* system of cueing is passive. It blends the activity of the battlefield with the advancements in technology. The technology with target acquisition application is new but very promising.

I congratulate Mr. Baxendale for taking pen to paper. I hope we see more warrant officers take the initiative and use *Field Artillery* as a forum to ask questions, share experiences and let their ideas be heard.

Thomas Curran
CW3 (Ret), USA
Lawton, OK

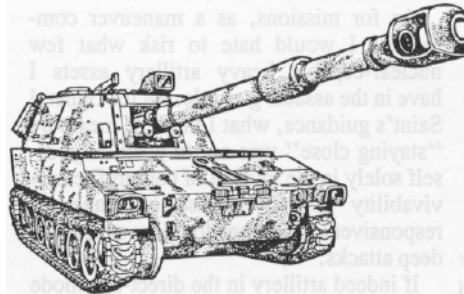
Response to "TOPFORM"

Captain Gary M. Stallings' article "TOPFORM" (June 1988) describes a unique way to support the maneuver brigade. His TOPFORM concept does provide close, continuous fires for maneuver forces. However, there are some portions of the concept that need further discussion.

From personal experience (firing platoon leader for C Battery, 2d Battalion, 29th Field Artillery, Baumholder, Germany), I found the three-platoon configuration doesn't work. After our mess section and maintenance team consolidated at battalion, our non-firing platoon consisted of one supply truck and the first sergeant's jeep. That platoon could not defend itself or support the firing platoons.

We found the best solution was to make two platoons. The support sections collocated with one of the firing platoons. That didn't hinder the movement of the firing platoons because, at the most, we added only two vehicles to the formation. Because the battery occupied less terrain, we were better able to control our elements, and the support resources were readily available to the firing platoons.

Emplacing the firing platoons three kilometers apart makes it nearly impossible to



run wire between the platoons. We found it critical to "tie-in" the two platoons by wire so we could control all eight guns by one FDC [fire direction center]. If (and often when) we lost an FDC, we could still provide eight-gun fires for the maneuver forces.

In addition, the ammunition carriers' positioning seems to imply that camouflage nets are no longer used (the carriers are 300-400 meters from the guns). They need to have that radar-scattering net for survivability.

The FARRP [forward area rearm and refuel point] is providing fuel already. There is no reason not to re-arm at the FARRP also. Using ammunition carriers to deliver rounds to the guns assumes you have responsible soldiers in the carriers (e.g., can

read a map, understand tactical movements and SP [starting point] times, etc.) and, most importantly, have some sort of communication means. It also doesn't make sense to put ammunition in the bustle racks. If missions are going on continuously, it will be impossible to fill the racks anyway.

The FAARP originally was designed to provide a unit all types of support. Linen exchange, mail and ration issue are several other activities that could occur at the FAARP. However, Captain Stallings is correct. FARRPs should only exist long enough to re-fit a unit. All activities must be done as fast as possible.

TOPFORM is an interesting concept. We need to continually update how we support our maneuver forces as their capabilities evolve. At the same time, we must avoid blanket statements like "TOPFORM has proved to be the most effective way to employ the 3x8 firing battery." The 3x8 concept is still new and will continue to evolve as the Army fully converts to 3x8.

Brian T. Boyle
CPT, FA
Div FSE
101st Abn Div (AAslt)

M7 High-Angle Fire? No Way!

If you read *Field Artillery*, you're certainly bound to learn something.

I commanded an M7 battalion from 1943 to 1946 (3d Armored Field Artillery, 9th Armored Division) and later the 4th Armored Division Artillery. Until I saw the caption under the photograph on Page 29 of the August issue of *Field Artillery* ["On Time—On Target, The Birth of Modern

American Artillery"], I never knew my guns could shoot high-angle fire. No question about their being used for direct fire—several times and twice at a range of 300 yards.

Maybe the next issue of *Field Artillery* will tell me how high-angle missions are fired with an M7, 105-mm howitzer. Park the carriages on the side of a hill with a

45-degree slope?

George Ruhlen
MG (Ret), USA
San Antonio, TX

Field Artillery provided the picture and caption on Page 29, not the author. You got us!

Editor

Response to "The Flying Box"

Captain Jorge M. Fernandez's article "'The Flying Box': Supporting the Mobile Armored Corps" (June 1988) was interesting. The formation clearly has a lot to offer, and no doubt we will experiment with it in our battalion. Nevertheless, there were some disturbing ideas on the positioning of the platoon relative to the FLOT [forward line of own troops], as well as the type of missions the platoon was called upon to perform.

For example, in regard to positioning, the M110A2 will not survive long 2,000 meters from the FLOT (let alone 500 meters behind the "leading combat element" bunker busting!). C'mon, give the other guy credit. He's going to be throwing everything he can at the close-in battle...especially at strong points that will be covered by everything from mines to AT [antitank] rockets, heavy machineguns, tanks and, most of all, concentrated artillery. In direct support of a cavalry squadron, we employed Storm Artillery during REFORGER, and it worked!

If you want a historical precedent, look at what happened to the flying batteries of

the Civil War. They had similar tactics, and they didn't last long. Also, as pointed out in Captain John Gordon's article "The Evolution of Soviet Fire Support, 1940-1988" (same edition), in World War II the Soviet loss rate of guns with a similar mission (accompanying artillery) was 10 times greater than that of normal artillery. Regardless, the battlefield is crowded enough already; you don't need an 8-inch platoon running around a stone's throw from the FEBA [forward edge of battle area]! "Storm Artillery"—M109A3s far forward, engaging targets three to four kilometers out—is one thing; M110A2s at half a klick is another.

As for missions, as a maneuver commander I would hate to risk what few nuclear-capable heavy artillery assets I have in the assault-gun role. As for General Saint's guidance, what I think he meant by "staying close" was not to position yourself solely in the interest of counterfire survivability at the expense of maneuver responsiveness or range for close support of deep attacks.

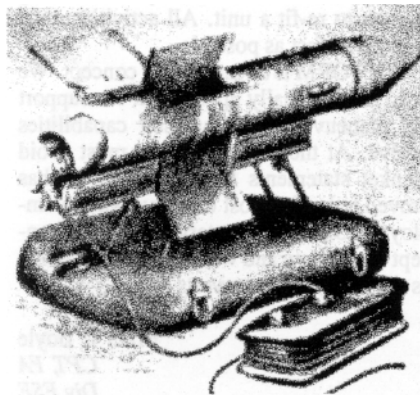
If indeed artillery in the direct-fire mode

becomes commonplace and I am wrong about General Saint's idea, then HIP needs improved laser direct-fire sights, kevlar skirts and reactive armor to be effective and survivable. Then take the concept to its logical conclusion and make DS [direct support] battalions close support battalions organic to the maneuver brigades so they can best be integrated into the general scheme of battle without a force artillery string.

Bottom line: the Flying Box formation itself is a fine idea. The good Captain is an innovative and imaginative thinker. What I take issue with is the weapon system—where it is on the battlefield and what it does.

Gary B. Griffin
LTC, FA
Cdr
3-17 FA

Response to "The Ramadan War"



The Manpack AT-3 "Sagger," seen here on its launch pad, was the anti-tank missile system used so effectively by the Egyptians in the 1973 War.

Your August 1988 issue of *Field Artillery* carried an article "The Ramadan War: Fire Support Egyptian Style" by Captain Robert D. Lewis. I commend him for doing his homework and for presenting to artillerymen (I still consider myself to be one) lessons learned and challenges for the future. My last few assignments would tend to confirm Captain Lewis's findings and recommendations.

Without intending to degrade his article but rather to enhance its value, I offer the following. The picture of the Soviet BRDM-mounted AT-5/SPANDREL antitank guided missile system [ATGM] on Page 35 may be taken by the uninitiated as indicating that system was used by the Egyptians in the 1973 War. It was not. As a matter of fact, the AT-5 was not observed by Westerners until the Moscow parade of 7

November 1977. It was the now obsolete AT-3/SAGGER system that was so effectively used by the Egyptians during the 1973 War. And they did, indeed, use it well.

The article's point—the Egyptians lost their early artillery advantage—can be even more emphasized by the knowledge that, with their Soviet 130-mm M-46 Field Gun (its range exceeds 27 kilometers), the Egyptian artillery far exceeded the range of Israeli supporting artillery.

My charge to Captain Lewis—keep writing.

Paul Miller, Jr.
LTC (Ret), FA
Falls Church, VA

Oops! Field Artillery provided the picture on Page 35, not the author.

Editor

Response to August History Edition of *Field Artillery*

For many years, I have thought artillerymen weren't interested in history. This conclusion was reached by finding in print only two authors, Fairfax Downey

and K. Jack Bauer. The former has written many books on artillery but has stopped because of his age; the latter published, as far as I know, a book on the Mexican War.

By your pushing the [History] Writing Contest, you are developing quite a number of interesting authors. The most prolific of these is Major David T. Zabecki [author of

"The Dress Rehearsal: Lost Artillery Lessons of the 1912-1913 Balkan Wars," third-place winner of the 1988 History Writing Contest]. The best of these is Lieutenant Colonel Jerry D. Morelock, the winner of the 1986 contest [with his article "Death in the Forest"]. I do hope you continue to obtain outstanding articles, as in these two contests.

The Contest brings out stories dealing with actual problems encountered in battle by artillery. These are needed. I liked Bismarck's quotation: "Fools say they learn by experience. I prefer to learn by other people's experiences" [Major General Raphael J. Hallada's "On the Move" column, titled "Truth in History"].

Now, that does not mean we apply the experiences of the last war to the next one. The First Battle of Bull Run during the Civil War is an example of the futility of that notion. In that battle, McDowell ordered Griffin's and Rickett's batteries forward in front of the infantry, as was done in the Mexican War. The result was the loss of the two batteries. American rifles shot farther than Mexican fusiles. There had to be a change in military tactics; McDowell, an artilleryman in the Mexican War, was behind the times. That kind of mistake can happen if one reads history without applying it to current innovations. History is a foundation only; it is the cornerstone upon which the future "building" is to be established.

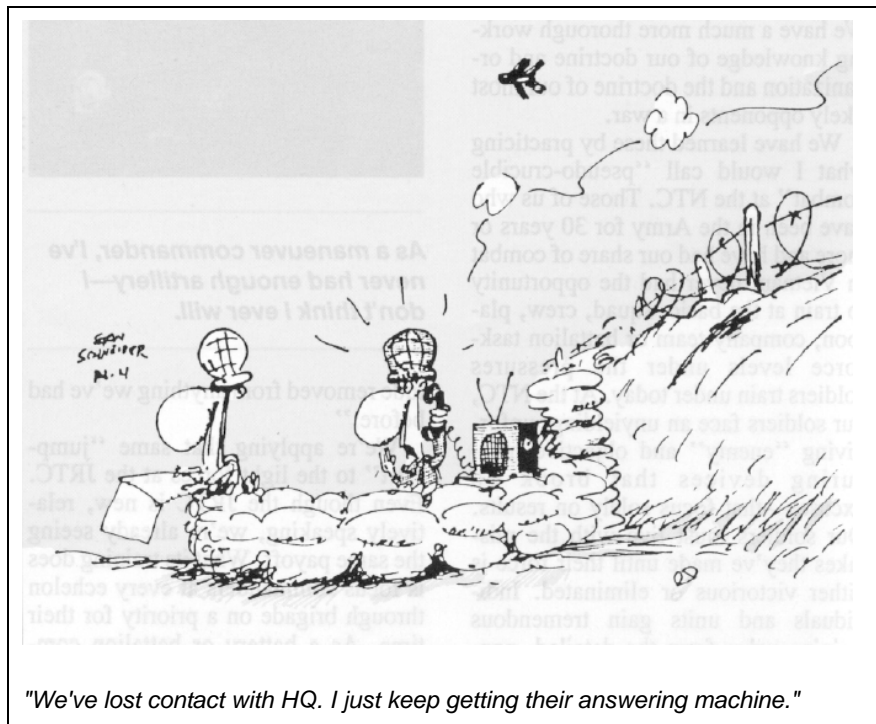
Currently, I am a bit discouraged. The reason is our hopes of a NATO success are based on technology. The thinking is in the present. Congress, denying adequate funds for technological implementation, is leaving NATO (and particularly US forces based in Europe) in a depleted condition. This alarms me. If you read the *Field Artillery* interviews with ranking artillery Generals (Guthrie, Otis, Kroesen, etc.), you find all are pessimistic as to the ability of forces in Europe to withstand a sudden Soviet advance. Even the SACEUR [Supreme Allied Commander, Europe], General Galvin, has his doubts as to whether our forces can hold until US reinforcements arrive. Technology is good, but it has to be available—not on the drawing board.

Thanks again for developing good artillery authors through the Writing Contest. It was a void that required filling.

Robert M. Stegmaier
COL (Ret), FA
Sun City, AZ



"Now there's a real artilleryman. When his piece is inoperative, he delivers the shell personally!"



"We've lost contact with HQ. I just keep getting their answering machine."



General Joseph T. Palastra, Jr., Commander-in-Chief of Forces Command

Train to Face an Unyielding, Unforgiving Enemy

As you've said on several occasions, training is FORSCOM's [Forces Command's] highest priority. What impact have the NTC [National Training Center, Fort Irwin, California] and the JRTC [Joint Readiness Training Center, Fort Chaffee, Arkansas] had on FORSCOM's combat readiness?

We're at a plateau now in training that has steadily improved during the last several years. The advent of the National Training Center has been one of the singular features of our training environment during the last 10 years that has literally turned around our attitude toward, our approach to and the results of our training. We have raised a generation of trained, capable leaders, commissioned and noncommissioned. We have a much more thorough working knowledge of our doctrine and organization and the doctrine of our most likely opponents in a war.

We have learned these by practicing what I would call "pseudo-crucible combat" at the NTC. Those of us who have been in the Army for 30 years or more and have had our share of combat in Vietnam never had the opportunity to train at the basic, squad, crew, platoon, company-team or battalion task-force levels under the pressures soldiers train under today. At the NTC, our soldiers face an unyielding, unforgiving "enemy" and objective measuring devices that brook no excuses—that focus solely on results. Our soldiers must live with the mistakes they've made until their force is either victorious or eliminated. Individuals and units gain tremendous training value from the detailed, non-accusatory, after-action review procedures we have today. Such training has raised a standard of excellence for our wartime performance that is, to use an overused phrase, "an order of magnitude



Jim McMurray

As a maneuver commander, I've never had enough artillery—I don't think I ever will.

removed from anything we've had before."

We're applying that same "jump-start" to the light forces at the JRTC. Even though the JRTC is new, relatively speaking, we're already seeing the same payoff. What its training does is focus commanders at every echelon through brigade on a priority for their time. As a battery or battalion commander or brigade staff officer, each must focus on the most important tasks to perform his wartime mission.

When you add to that training the newly developed battle command

training program [BCTP], which gives division and, eventually, corps commanders and their staffs an NTC-like experience, we now find the same attitude toward developing a working knowledge of how to apply our doctrine on the battlefield and of how the enemy applies his. We've run two active divisions and one National Guard division through the BCTP seminar and exercise phases. We have two more divisions that have either finished or are taking the seminar phase. The payoff already is enormous.

Ten or 12 years ago, a division commander would go into command and his mind would be occupied with a lot of pass or fail criteria. His AWOL rates, budget execution, safety statistics and training and maintenance were among the many considerations on an over-full platter. Now a commander goes into a command in FORSCOM and his priority focus, in fact as well as in name, is on training to standard to be able to execute in a very demanding set of circumstances—NTC, JRTC and BCTP. It literally has been a significant turnaround for us.

When you couple that training experience with the wartime alignment of the Total Force, you force a focus on your wartime mission. In Forces Command, we've "put our money where our mouth is" for a long time, aligning our active, Guard and Reserve units under a Capstone program. We continually build closer working relationships among gaining wartime commanders and peacetime units—right down to the company-team-detachment level. Given a host of tasks you must execute as a Total-Force unit and having limited time, you have to choose your priorities, whether you're in the Active or Reserve Components.

That kind of focused attention on wartime tasks translates into peacetime

Battle Command Training Program

training priorities. Coupling those priorities with the training opportunities I discussed has meant a major turnaround in attitude and force proficiency in Forces Command. As I look out at the 12 out of 18 active divisions I'm fortunate enough to command, I can see steady improvement. From the time 10 years ago when I was the 5th Division Commander in FORSCOM through the two years I commanded I Corps and the two years I've commanded FORSCOM, I've seen that improvement.

What have we learned from NTC about providing effective fire support to the maneuver commander?

When General Pete [Horace G.] Taylor [now commanding the 24th Infantry Division (Mechanized), Fort Stewart, Georgia] went out to take command of the NTC two years ago, I gave him his priority mission: come up with an indirect-fire simulation system that can influence the direct-fire maneuver battle as it unfolds. Because right now, the least successful part of our training has been our forces' appreciation and integration of indirect fire into the direct-fire maneuver battle. Therefore, the commander and staff officer, as they're preparing for and executing fast-paced, high-pressure battle, tend to overlook or incompletely plan for or integrate indirect fire into their direct-fire maneuver scheme. They aren't really synchronizing all combat power. And until they do, we're never going to achieve our full potential as a combined-arms team. Of all the initiatives to improve the integration of indirect fire support in our training, CATIES [combined-arms training integrated evaluation system] is number one on my priority list.

Some people have said the balance between fire and maneuver in peacetime has gotten out of whack. How do you see the balance between maneuver and fire support in FORSCOM?

It's an unfortunate fact of life that in peacetime, as you become increasingly

The capstone of the four combat training centers (CTCs) is the Battle Command Training Program (BCTP), first started in November 1987 at Fort Leavenworth, Kansas. The first CTC, the National Training Center (NTC), Fort Irwin, California, trains heavy forces in the continental US for mid- to high-intensity combat against a Soviet Threat. The Joint Readiness Training Center (JRTC), Fort Chaffee and Little Rock Air Force Base, Arkansas, trains non-mechanized forces in low- to mid-intensity combat against Third World or Soviet client-state Threats. The Combat Maneuver Training Center (CMTC), Hohenfels, West Germany, trains US Army, Europe, heavy forces for mid- to high-intensity combat against a Soviet Threat. But the BCTP pulls the training of all of the CTCs together at higher echelons. It trains Army-wide division and, eventually, corps commanders to face and defeat any Threat worldwide in low- to high-intensity combat.

The BCTP is for the Total Army, Active and Reserve Components. It will exercise all 28 divisions and the five corps in a two-phase program: a tactical seminar and a command post exercise (CPX).

The seminar brings the commander, his staff and his major subordinate commanders together to

focus on AirLand Battle doctrine in a five-day series of workshops and a tactical decision exercise, using battle simulations. The seminar topics cover four major areas: doctrine, tactics, leadership, sustainment and threat.

The five-and-one-half-day War-Fighter CPX follows the seminar by two to six months. It's conducted at the participating unit's home station in a tactical CPX mode to practice the skills the commander needs to synchronize battlefield systems in vigorous, 24-hour-a-day operations. It stresses operations at the tactical, main and rear command posts, as well as the combat service support headquarters. The BCTP staff executes the CPX as the opposing force, mobile player controllers, after-action reviewers and operators of the corps battle simulation system (CBS), which consists of a VAX 8600 computer linked to 13 MICROVAXs with the joint exercise support system (JESS) software.

The goal of the program is to train a commander to be bold and decisive and his staff to give him efficient and effective support. Together, they'll be better able to disrupt the enemy's plan, act inside his decision cycle and execute the tenets of AirLand Battle—better able to use the first battle to win the last.

This article is a condensation of "Combat Training Center and Battle Command Training Programs Put Leaders and Soldiers to the Test" from *Army* magazine, October 1988. Copyright 1988 by the Association of the US Army and reproduced with permission.

concerned with safety, you tend to artificially constrain the ways in which you employ indirect fire. Therefore, human nature being what it is, the tendency is to concentrate on those things you can employ most effectively and with the fewest constraints.

The fact is, that as you get closer to and get engaged in combat, you discover indirect fire produces a great amount of the Army's killing effect. Therefore, it's incumbent on us—number one—to continually and rationally fight the tendency toward overly restrictive safety procedures in

peacetime training. When we restrain overhead fire of mortars or artillery rocket systems, that gives us a sterile, artificial training environment that could lead us into very dangerous mistakes on the battlefield.

Anything we can do in training to "bring home" the devastating effects of the Soviet's indirect fires is going to save lives if we have to go to war.



INTERVIEW



Jill Ponto

Our leaders must be better than anybody they're likely to face on a battlefield.

When you ignore the indirect-fire part of your combat equation, you also tend to ignore the enemy's side of the equation. Anything we can do in training to "bring home" the devastating effects of the Soviet's indirect fires is going to save lives if we have to go to war.

Do we have enough artillery right now to support General [John R.] Galvin in Europe [Supreme Allied Commander, Europe and Commander-in-Chief, US European Command]?

You're asking a guy who was severely chastized by a corps artillery commander in Vietnam when I was an infantry battalion commander for firing too much artillery in support of my battalion. As a maneuver commander, I've never had enough artillery—I don't think I ever will.

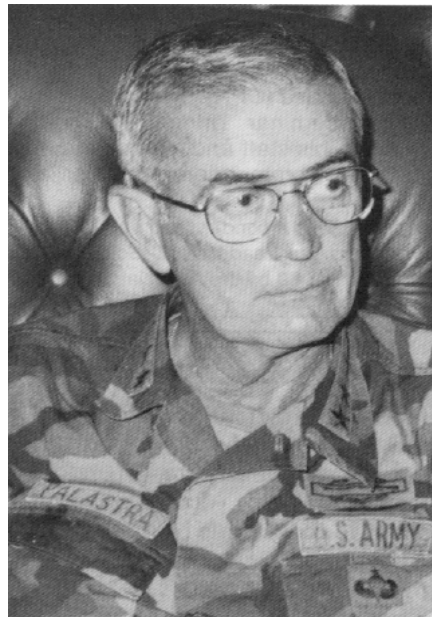
Sooner or later, all artillerymen work for FORSCOM. Could you summarize your command philosophy?

My command philosophy is very simple. I wrote it down and it covered less than two pages, front and back. We exist primarily to produce a force of

soldiers who are organized, equipped, trained and led to fight and win on any battlefield in the world in support of our overseas commands.

To do that, we require a couple of things: capable leaders and effective family support systems. We need leaders, commissioned and noncommissioned at all echelons, who are tactically and technically competent. They must be absolute masters, highly skilled in the tools of their trade.

These leaders also must be physically and mentally tough. Physically tough because ours is a physically demanding profession. Mentally tough because you have to be able to stand the pressures of combat and continue to do your job regardless of the human instinct to do something else. If you are that kind of leader and can then train and educate your soldiers—show them what you want them to do and how to do it to the standards that are demanded—then you'll be a successful leader for a FORSCOM unit. Our leaders must be better than anybody they're likely to face on a battlefield.



Jill Ponto

Of all the initiatives to improve the integration of indirect fire support in our training, CATIES is number one on my priority list.

The leader then has to teach, train and correct. Unfortunately, he sometimes finds soldiers he's leading can't learn. Then, and only then, will he have to move them aside. Leaders sometimes are reluctant to make that kind of decision.

Fortunately for us, because of the increasingly high quality of soldiers we're getting, we find it less and less necessary to admit a failure. The soldiers we're getting are so completely trainable that more often the leader has to work a little harder, study a little longer and stay far enough ahead of his soldiers to continue to teach them. So, leaders are high-quality in FORSCOM today.

The most effective thing you can do to take care of your soldiers is train them well for combat. But in peacetime, you have to recognize there are competing demands on their time. More than half of the soldiers in Forces Command are married. So you have to create an environment where they're free from the mental pressure of concern about what is happening to their families or what will happen to them if they deploy. We have to create a family support system, a chain of support, to take care of the family while the soldier's in garrison, as well as when he's on field exercises or extended deployments or, God forbid, at war. As a professional and leader, if you take care of training the soldier and developing a chain of concern for his family, then you'll have a strong, resilient force that can meet whatever challenges come down the road.

General [Jack N.] Merritt referred to the Field Artillery as the "Once and Future King of Battle" [in the interview "Exploit Technology to Defend NATO" as General Merritt retired as US Representative to the NATO Military Committee, February, 1988]. Is Field Artillery still the King of Battle?

Let's look at it in terms of what the Army's job is in the AirLand Battle. Essentially, the Army's job is to take a piece of land and destroy an enemy's ability to either attack us or prevent us from taking whatever objective we've



Jill Ponto

One of the principal means of destroying the enemy is indirect fire—you can strike him at long ranges and continue to strike him.

been sent by our political leaders to take. In doing that, we apply the same principles applied by people fighting each other for the last several thousand years. We apply a preponderance of combat power against an enemy and either kill all of the enemy or enough to destroy his ability to resist.

One of the principal means of destroying the enemy is indirect fire—you can strike the enemy at long ranges and continue to strike him. Either you're closing with him or he's closing with you. When you combine indirect fire's ability to inflict enemy casualties—regardless of the weather or terrain—with our increasingly lethal direct-fire systems, then you begin to see what synchronization on the battlefield really means. You bring together in time and space such a preponderance of combat power that you achieve your objective and deny the enemy his.

What's the primary killer on that battlefield—direct or indirect fire? I can no more predict that than I can

predict the outcome of each discreet battle. But the artillery deserves its title, King of Battle, because it will inflict a significant proportion of the casualties in a total AirLand Battle conflict. ✕

General Joseph T. Palastra, Jr., is Commander-in-Chief of Forces Command. He commanded I Corps and Fort Lewis, Washington; the 5th Infantry Division (Mechanized) and Fort Polk, Louisiana; the 3d Brigade, 101st Airborne Division, Fort Campbell, Kentucky; and, in Vietnam, the 1st Battalion, 12th Infantry, and B Company, 4th Aviation Battalion. General Palastra also served as Chief of Staff, Eighth Army and US Forces in Korea; Deputy Commander and Chief of Staff, US Pacific Command, Camp H. M. Smith, Hawaii; and as a force-structure analyst in the Office of the Chief of Staff and a war-plans officer in the Office of the Deputy Chief of Staff for Military Operations, Washington, D.C.

View from the Blockhouse

From the School

OH58D: Sending Refinement Data and Eliminating False Failure Advisories

The OH58D helicopter can produce accurate fires when you use the on-board systems properly. At the completion of the mission, if desired, the airborne target handover system (ATHS) allows the operator to send refinement data with the end-of-mission message. Aerial fire support observers (AFSOs) should be aware the SHIFT key (L-4) on the ARTY MSN SUMMARY PAGE is **not** for refinement data. To include your refinement data, select ADJUST (L-2) and then END MSN (L-4). This will return you to the ARTY MSN SUMMARY PAGE with DSPO/CAS displayed at L-4 instead of SHIFT. Enter the appropriate disposition and then casualty information, and you will arrive at the DSPO/CAS SUMMARY PAGE with the word SHIFT at L-4. This SHIFT key on the DSPO/CAS SUMMARY PAGE is for entry of refinement data. The information entered here will be transmitted only with the END MSN message. Remember, one shift buffer for adjustments and a separate one for refinements.

A visit to Fort Sill by technical representatives for the mast-mounted sight (MMS) subcontractors yielded a method for eliminating some false laser failure advisories in the diagnostics. In the past if the laser failed to ARM, the procedure was to cycle the LASER ARM switch several times in quick succession. The technical representatives indicated the laser takes a second and one-half to power up and complete its internal checks before responding with the ARMED status message. If power is removed while the laser is performing the internal checks (for instance, by cycling the laser switch), the laser will fail the checks and record a fail advisory in the diagnostics. The obvious cure is to leave the laser in the OFF, STBY or ARM position for at least 2 seconds before moving to any other position, thus allowing the system to complete the internal checks.

Another action that will cause false errors concerns the tail rotor inhibit area. The laser is mechanically de-armed when it enters the tail rotor inhibit area. If the laser is in the ARM position and the sight is allowed to slew into and out of the tail rotor inhibit area in less than two seconds, the false failure messages again will be recorded.

If AFSSOs have questions, call the Aerial Observer Branch, Fire Support and Combined Arms Operations Department, Field Artillery School, at AUTOVON 639-6826 or commercial (405) 351-6826.

The ATHS—TACFIRE Interface

The opposing forces (OPFOR) independent tank battalion commander was having a good day. His division's plan had tricked the Americans into committing their armored reserves against strongly defended positions. By now, they were decisively engaged and wouldn't be available to counter his thrust into the lightly screened flank of the advancing American division. Soon he would commit his tanks, striking deep into the American's rear area. Before the end of the day, the Americans would have lost the initiative.

The OPFOR commander could not know an aerial fire support observer (AFSSO) in an OH58D, using the airborne target handover system (ATHS), was accurately reporting the location of his units. Because the tactical fire direction system (TACFIRE) automatically disseminates targeting information, his activities were quickly known to the American commander. The OPFOR commander's first indication he had lost the element of surprise was when his lead elements were engaged by laser-guided munitions and massed artillery fire. He knew then his only advantage was lost, and the outcome of the battle was now uncertain.

ATHS

The ATHS enhances not only target location, but target dissemination capabilities as well. When linked with TACFIRE, a target reported by an AFSSO is sent to all concerned agencies. For example, a maneuver brigade fire support element (FSE) receives an ATHS-reported target that plots in the brigade zone in a matter of seconds. This is how we support maneuver commanders.

TACFIRE Communication

Communications with a TACFIRE computer is critical to use fully the ATHS capabilities. First the unit writes its standing operating procedure (SOP). The ATHS is entered into the subscriber table as a fire support team digital message device—FIST DMD—(device type Z) forward observer with laser (G field-entry 1). Most OH58D and TACFIRE communications problems start when the ATHS is entered into TACFIRE as a DMD (device type T). TACFIRE communicates with ATHS as if it were a FIST DMD. All other subscriber table entries are identical to aerial observers without ATHS.

Second, during the briefing before flights, the division artillery targeting officer—the battalion S2 or S3 or the appropriate fire support officer—briefs the AFSSO on the mission. It's critical that a fire control element (FCE) or fire direction center (FDC) representative attend. The AFSSO and TACFIRE representative can then coordinate the TACFIRE

variables before the mission. In this briefing, it's important to verify the AFSSO has the current edition code books and ensure these code books match the subscriber's communications security identification (COMSEC ID) in the TACFIRE subscriber table.

During ATHS initialization, set the ATHS preamble (PRE) to 1.4 and monitor (MON) to 1.5 on the appropriate net. ATHS's MON is the same as TACFIRE's "delay." Enter the correct authenticators into the authenticator table. "Send" codes are in the type 1A code book, and "receive" codes are in the type 1 code book. Once the authenticators are entered, select BOTH:MODE on the authenticate control page. Go to the subscriber net assignment page 3/3 and enter the TACFIRE ID logical name next to AUTH SUB. Last, be sure that NONE is next to AUTH on the appropriate net control page. This will disable the manual authenticate function.

Finally initialize and establish communications before the AFSSO leaves the ground. Resolve any communications problems while still face-to-face.

Authentication Synchronization

Following the above steps doesn't guarantee you'll maintain communications. Authentication synchronization is essential to maintaining communications. Synchronization is lost when TACFIRE or ATHS sends a transmission to the other without line of sight. The ATHS authentication synchronization message sends a plain-text message (PTM) to TACFIRE. The PTM contains the ATHS transmit (XMIT) number and receive number. The TACFIRE operator adjusts the subscriber table (Q field) to these numbers.

A problem occurs when the ATHS numbers are lower than the numbers in the TACFIRE subscriber table. The TACFIRE operator can't lower the ATHS numbers; therefore, he must initiate manual resynchronization procedures. For manual resynchronization, the TACFIRE operator tells the ATHS operator the next receive message number and transmit message number that the ATHS operator needs to enter in the authentication control entry page. When the ATHS operator does this, ATHS should be back in synchronization with TACFIRE.

Conclusion

The Field Artillery School teaches these procedures to aerial fire support coordinators and TACFIRE fire direction officers. However, graduates must sustain these skills at their next duty stations. The ATHS operators must constantly train with TACFIRE operators to sustain their skills.

If units have questions, call the Fire Support Automated Branch, Command and Control Division, Fire Support and Combined Arms Operations Department at AUTOVON 639-3811 or commercial (405) 351-3811.



3x8 Strategy: A Product Improvement

by Captain Thomas J. O'Donnell

Since the 3x8 organization for Field Artillery hit the first field unit in 1984, we've changed very little of the initial concept. Can we still improve it? Will our improvements work? Of course!

Regardless of how we change the concept, we must fix the inadequacies of command and control and reconnaissance in our 3x8 units. The time to act is now!

It seems that when we fielded the split batteries, we gave little consideration to two major Field Artillery concerns: command and control and reconnaissance. Under the 3x6 organization, these concerns weren't as much of a problem for the battery commander. His entire element was located in a 400 by 200-meter footprint. He and the first sergeant personally handled all of the reconnaissance, selection and occupation of positions (RSOPs) and advance-party procedures. When the commander needed to move, he moved his entire battery.

Under a 3x8 organization, movement is a different story. The battery is divided into three separate elements spread over an area of three to five kilometers. The firing platoons are lighter, with the majority of the support in the battery trains. Movement is frequent and rapid, with the platoon leaders responsible for their own

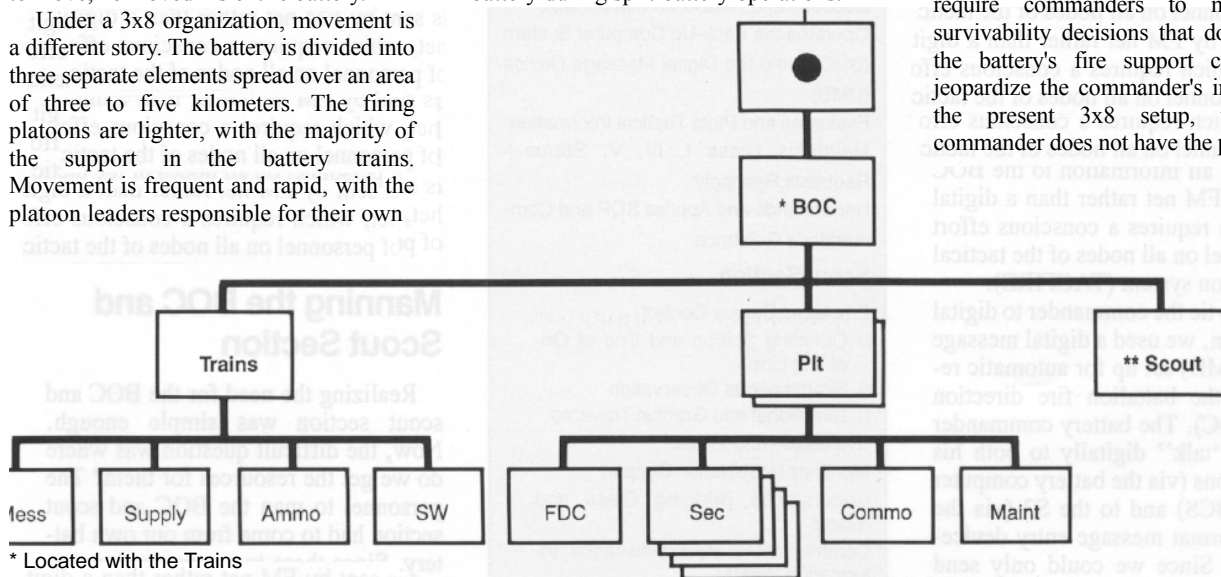
reconnaissance. Currently, the commander's span of control has increased greatly, and his involvement in reconnaissance has decreased significantly.

These changes, however, were essential for the artillery to keep up with the fast-moving AirLand Battle and survive. The challenges will be even greater in the late 1990s with greater dispersion and independent howitzer movements. We must bridge the gaps between 3x6 doctrine, the current 3x8 concept and the future employment of the semiautonomous howitzer improvement program (HIP) howitzer. Currently, we have no easy solutions to satisfy the commander's concerns about command and control and reconnaissance for the battery during split-battery operations.

Developing New Tactics

The 1st Armored Division Artillery, US Army, Europe, decided to take a step forward and look into the next generation of artillery tactics. A study group at the Division Artillery realized the need for even greater dispersion and quicker movements to increase our survivability on future battlefields and the impact of these needs on the way we do business in the Field Artillery.

The group saw the firing platoons' and the trains' having to move more frequently than they thought possible because of the increasing sophistication and quantities of Warsaw Pact counterbattery radar systems. This, coupled with a limited platoon security against a ground attack, will require commanders to make quick survivability decisions that don't sacrifice the battery's fire support capability or jeopardize the commander's intent. Under the present 3x8 setup, the battery commander does not have the personnel



* Located with the Trains

** Located Forward of Both Platoons

The 3x8 Organization of C Battery, 1st Battalion, 22d Field Artillery, with the New BOC and Scout Section

February 1989

nor the equipment to fulfill today's needs effectively, or those of the future azimuth of the Field Artillery.

Hence, the study group suggested introducing two innovative organizations using the battery's and battalion's own assets: a battery operations center (BOC) and a scout section, each using a gunnery sergeant and an M113A2 tracked vehicle, the latter from the fire support team (FIST) platoon. Units also could use a high-mobility multipurpose wheeled vehicle (HMMWV) or another comparable vehicle. My C Battery, 1st Battalion, 22d Field Artillery, established the first BOC as a centralized command and control platform for the commander to better control his three elements. It also established a scout section as a formalized battery reconnaissance element that operated under the personal direction of the commander.

BOC

The BOC is essentially the battery tactical operations center (TOC) or the "eyes" of the battery through which all reports and tactical information flow. It maintains the situation map and houses the emergency action procedures (EAP) safes.

The location of the BOC depends on the tactical situation; however, I positioned it to best control the two firing platoons and the battery trains. I found the most effective position is to locate it with the battery trains. The key point is everything filters through the BOC, allowing the commander to have complete access to all information, whether he's physically at a platoon firing position or on the road.

In the digital world we operate in, however, the commander doesn't have timely access to digital information. Therefore, all information to the BOC is sent by FM net rather than a digital net, which requires a conscious effort of personnel on all nodes of the tactical fire direction system (TACFIRE).

To try to tie the commander to digital information, we used a digital message device (DMD) set up for automatic relay from the battalion fire direction center (FDC). The battery commander can then "talk" digitally to both his FDC sections (via the battery computer system—BCS) and to the S3 (via the variable format message entry device-VFMED). Since we could only send plain-text messages (PTMs), which were time consuming and limited, the

DMD isn't the answer but rather a step in the right direction. The ideal solution is to mount the next generation of a lightweight digital terminal in the BOC to give the battery operations NCO and the commander access to digital information.

Under 3x8, a commander could find himself darting back and forth between his platoons and the battalion TOC to find out the current status, when minimal command and control information is passed over the command frequency. The BOC's prime function is to alleviate this problem by seeking out all battlefield information and keeping the commander well informed. The commander spends approximately 40 percent of his time with the BOC and 60 percent with his scout section.

Scout Section

In addition, when we implemented the 3x8 concept, we pulled the commander out of the ground reconnaissance process and put the platoon leader in the "driver's seat." The commander and the first sergeant lost a major portion of their old duties—control of the advance party. The first sergeant now has the trains to keep him busy,

while the commander does the map reconnaissance and tags along to "observe" his platoon leaders in action. It seems that under the 3x8 organization, the commander isn't as fully employed in the daily operations of the battery as he could be. We can use commanders better.

A scout section that operates forward of the advance party puts the commander to work in a vital function—reconnaissance. The commander and the scout team chief, a staff sergeant, work closely together to analyze platoon positions for gun locations, establish survey with a position and azimuth determining system (PADS) team or perform hasty survey techniques, when necessary. They also select primary and alternate routes to each position. Since the scout section can operate two to three positions ahead of the battery, more time is available to select survivable positions around the primary location, to include routes in and out. The commander must train the scout team chief to perform these operations independently since he can't always be there.

The section passes all reconnaissance information back to the BOC for dissemination to the platoons and trains before the advance party departs. We discovered the commander could move freely between the scout section and the battery, using his 1/4-ton or HMMWV, and still control the scout's activities via radio. Keep in mind the scout section was not designed to replace the advance party, only to augment the reconnaissance capability.

Once the scout section completes a position and passes the information back through the BOC to the appropriate platoon, the advance party leaves as late as five minutes before the main body. It follows that the more experience the scout team chief has, the more latitude the commander has to perform other duties.

Manning the BOC and Scout Section

Realizing the need for the BOC and scout section was simple enough. Now, the difficult question was where do we get the resources for them? The personnel to man the BOC and scout section had to come from our own battery. Since these two organizations required two competent and reliable NCOs, I pulled the gunnery sergeants

BOC and Scout Section Training Concept

BOC

Controls Platoons and Trains
Uses Radio Procedures as Battery Net Control Station
Decodes and Reacts to NRAS Traffic
Operates the Back-Up Computer System (BUCS) and the Digital Message Device (DMD)
Evaluates and Plots Tactical Information
Maintains Class I, III, V, Status—Requests Resupply
Understands and Applies SOP and Commander's Guidance

Scout Section

Emplaces Survey Control
 Orienting Station and End of Orienting Line
 Simultaneous Observation
 Directional and Graphic Traverse
Evaluates NBC Threat
Identifies Host-Nation Support
Understands Bridging Class and Assets
Communicates Reconnaissance Information Clearly

from both platoons to serve in this new capacity.

This is a logical move when you consider that under the old 3x6 configuration for an M109 unit, we only had an executive officer and the chief of firing battery (CFB) working with six howitzer sections. In the new 3x8 setup, we have a platoon leader, platoon sergeant and gunnery sergeant working with four howitzer sections. When not reconnoitering, we have too many people performing the same function—controlling the gun line.

With the gunnery sergeant not available to help the platoon leader on the advance party, I brought the senior section chief forward to perform this function, which caused the gunner to perform duties as section chief during this time. In essence, the platoon chain of command was training one level up—a good practice.

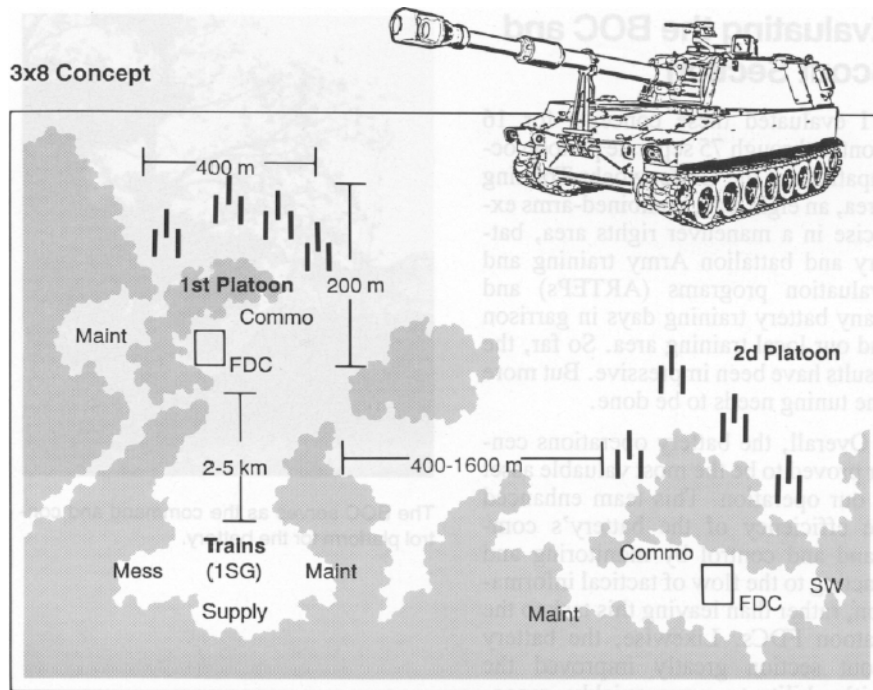
With the "assistant" platoon sergeant's performing needed functions for the battery, the platoon sergeant returned to his job as the platoon's true "smoke." This switch didn't hinder the efficiency of the platoons; in fact, this personnel shift enhanced the battery's overall performance of its wartime mission.

Equipping the BOC and Scout Section

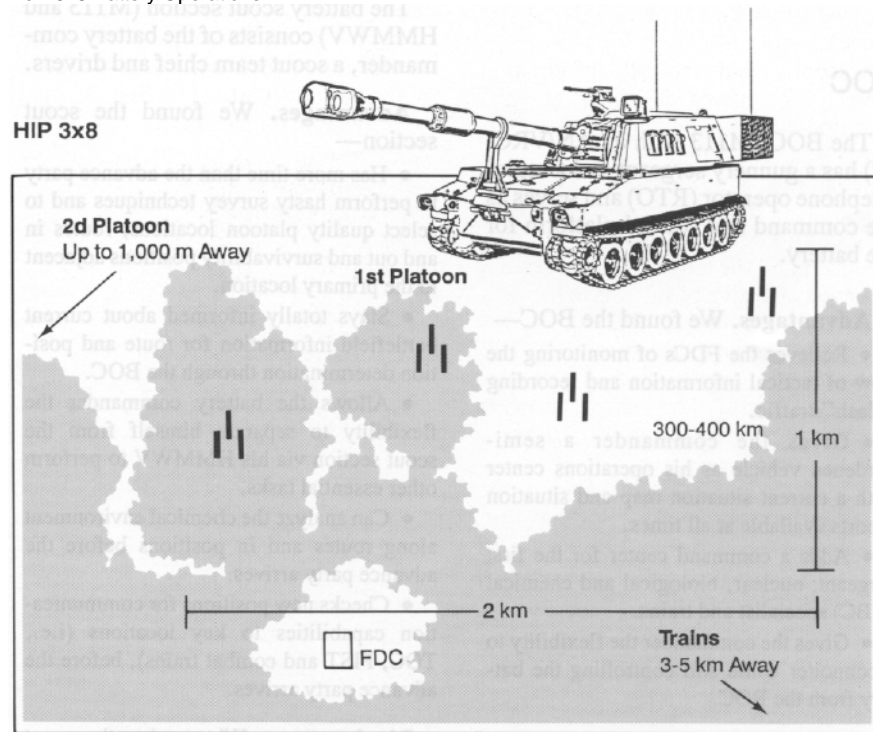
The equipment to make these sections function was not easy to get. We got two M113 armored personnel carriers (a Division Artillery program requesting their retention for valid firing battery functions) from the FIST platoon when the new fire support vehicle (FSV) was fielded. The radios were shifted from our own internal assets to give the BOC and scout section secure AN/VRC46 radios. The hardened vehicles and the radios have proven to be a worthwhile investment to serve as our command and control platform and for the reconnaissance section.

The personnel carriers, however, were not the only vehicles available for this purpose. We considered using the HMMWV, gamma goat or just a 1/4-ton truck for a scout vehicle and using a built-up HMMWV or M577 for the BOC. We selected the M113, first, because it was available and, second, because it was survivable and practical to perform the task.

An essential requirement for both



New 3x8 Battery Operations



New 3x8 Battery Operations (FY 90)

operations is a mobile platform that can communicate 12 to 15 kilometers in a secure mode. A good radio is a must. If you can't communicate, the operations aren't effective. Of course, it's best if the vehicle is highly mobile and survivable, but this may not be possible, given the current modified tables of organization and equipment (MTOE) authorizations.

The MTOE of the early 1990s should include a mobile, tracked vehicle. An upgraded M113A2, which is being replaced by the Bradley fighting vehicle and the FSV, would work well, in light of budget constraints. But the ideal choice to be able to keep pace with our maneuver arms would be a new Bradley.

Evaluating the BOC and Scout Section

I evaluated these concepts for 16 months through 75 separate platoon occupations at the Grafenwoehr Training Area, an eight-day, combined-arms exercise in a maneuver rights area, battery and battalion Army training and evaluation programs (ARTEPs) and many battery training days in garrison and our local training area. So far, the results have been impressive. But more fine tuning needs to be done.

Overall, the battery operations center proved to be the most valuable asset to our operation. This team enhanced the efficiency of the battery's command and control by monitoring and reacting to the flow of tactical information, rather than leaving this task to the platoon FDCs. Likewise, the battery scout section greatly improved the unit's ability to move quickly, reconnoiter positions and select routes.

BOC

The BOC (M113 with an AN/VRC-47) has a gunnery sergeant and a radiotelephone operator (RTO) and serves as the command and control platform for the battery.

Advantages. We found the BOC—

- Relieves the FDCs of monitoring the flow of tactical information and recording "flash" traffic.
- Gives the commander a semi-hardened vehicle as his operations center with a current situation map and situation reports available at all times.
- Adds a command center for the first sergeant; nuclear, biological and chemical (NBC) specialist and trains.
- Gives the commander the flexibility to reconnoiter while still controlling the battery from the BOC.

Disadvantages. When using the BOC—

- A gunnery sergeant isn't available for platoon operations.
- Twenty-four-hour-a-day operations are difficult to maintain.
- Digital information can't be transmitted to the BOC efficiently.
- Qualified nuclear release authentication system (NRAS) personnel must be in or near the BOC at all times.



The BOC serves as the command and control platform for the battery.

Scout Section

The battery scout section (M113 and HMMWV) consists of the battery commander, a scout team chief and drivers.

Advantages. We found the scout section—

- Has more time than the advance party to perform hasty survey techniques and to select quality platoon locations, routes in and out and survivability positions adjacent to the primary location.
- Stays totally informed about current battlefield information for route and position determination through the BOC.
- Allows the battery commander the flexibility to separate himself from the scout section via his HMMWV to perform other essential tasks.
- Can analyze the chemical environment along routes and in positions before the advance party arrives.
- Checks new positions for communication capabilities to key locations (i.e., TOC, FIST and combat trains), before the advance party arrives.

Disadvantages. When using the scout section—

- A platoon gunnery sergeant isn't available for platoon operations.
- Poor communication between the scout section and the BOC results in confusion and misinformation.
- The battery commander must rely on the BOC to control both platoons in his absence. Personnel turnover creates problems with the level of proficiency required.

Legitimizing BOC and Scout Section Positions

To sustain the BOC and the scout section within our battery in garrison, we decided to legitimize the BOC team chief and scout team chief's functions in the chain of command. The BOC team chief (a staff sergeant) became the headquarters platoon sergeant and served as the battery S3. The scout team chief (a staff sergeant) became the battery training NCO and trained the battery advance party for both platoons.

For the last 10 months of my command, we configured our battery that way. The overall performance in the training and management of the headquarters platoon noticeably improved. It's also interesting to note that neither of the firing platoons suffered because of the loss of its gunnery sergeant.

Aligning Our Azimuth

In summary, we've only scratched the surface in improvements to 3x8 operations. We have a lot of work to do to make the BOC and the scout section integral parts of our operations. We still must evaluate these concepts in a fast-paced, maneuver environment at the National Training Center, Fort Irwin, California, and then provide feedback to the Field Artillery School.

Based on their performance thus far, these operational refinements will enhance the King of Battle's support of maneuver forces on future battlefields while aligning us with the 3x8 azimuth of the Field Artillery.



Captain (P) Thomas J. O'Donnell is a Field Artillery Assignments Officer at the Total Army Personnel Agency (TAPA), Washington, D.C. He commanded C Battery, 1st Battalion, 22d Field Artillery, (redesignated the 2d Battalion, 1st Field Artillery), 1st Armored Division, US Army, Europe, when he implemented the 3x8 battery operations center and scout section organizations. Captain O'Donnell also served as battalion fire support officer and S1 for the 1st Battalion, 22d Field Artillery, and as a battery fire direction officer (FDO) and executive officer and battalion FDO and S3 for the 3d Battalion, 18th Field Artillery, III Corps Artillery, Fort Sill, Oklahoma.

3x8 and Beyond: Force Structure Changes for the Field Artillery of Tomorrow

by Captain Bernd L. Ingram

As one of the oldest sayings in the Army goes, "The one thing you can count on is that everything will change." Usually this applies to any standing operating procedure (SOP), operations order or other document that governs how we do our jobs. And, of course, such change is rarely appreciated by any of the participants. But Field Artillery force-structure changes are carefully planned and orchestrated to modernize the Branch.

Sometimes the development of newer weapons systems or munitions "drives" force-structure changes. Technology creates machines with capabilities we could only partially use under our old force design. Other times, force-structure changes come about because of innovative tactics developed in the field or imaginative configurations of units and equipment designed to take advantage of the weaknesses of our enemies. This article outlines how Field Artillery is projected to change by the year 2000 through equipment development, modernization and force structure.

Restructuring the Force

As the Army entered the 80s, it began a restructuring process called the Army of Excellence (AOE). To accomplish the AOE goals for the Field Artillery force (see Figure 1), we programmed the 3x8 conversion and multiple launch rocket system (MLRS) transition plans, as well as the shifting of 8-inch weapons to corps artillery.

The 3x8 conversion changes cannon units from six guns per battery (except those with 105-mm howitzers) to eight guns per battery. A heavy division direct-support battalion now fields 24 howitzers, as opposed to its previous strength of 18. A corps artillery 8-inch battalion that previously fielded 12 or 18 howitzers, now fields 24. To go with the weapons, each battery also added a second fire direction section equipped with a battery computer system (BCS) and a second platoon headquarters. To support its greater assets and size, the battalion also received additional logistical and maintenance personnel.

The final structure of a 3x8 battalion consists of the headquarters and service batteries and three eight-gun firing batteries. Each of the firing batteries fields two platoons of four guns each, giving the battalion six firing units that can operate independently or mass as required. Overall, the battalion has attained greater firepower, flexibility, maneuverability and survivability with a better personnel-to-weapons ratio. As

a whole, the cannon force has doubled its firing units without a significant increase in force structure.

- | Army of Excellence Goals |
|--|
| 1. Place cannon battalions and brigades forward to provide responsive support to maneuver fires. |
| 2. Provide a tailored brigade "slice" of artillery for each division from corps artillery. |
| 3. Mix calibers and capabilities whenever possible. |
| 4. Design artillery to match the mobility of the supported unit. |
| 5. "Streamline" units to enhance deployability. |
| 6. Achieve goals within imposed constraints, such as personnel caps. |

Figure 1: Field Artillery Force-Structure Goals

Conversion Schedule

The 3x8 conversion process began in FY 85 and is still going on. Figure 2 shows the percent of 3x8 conversions

for Active Component units in the continental US (CONUS) and outside CONUS (OCONUS). Figure 3 lists the Active Component organizations still to convert by FY 91.

Starting in FY 89, Reserve Component (RC) 8-inch and roundout units begin the transition to 3x8 to "upgun" the Total Force. The original plan (Figure 4) called for the Total Force to be converted by the end of FY 93. But incomplete weapon and other equipment procurements, unprogrammed force structure changes (i.e., restructure of the 9th Infantry Division) and the ramifications of the Intermediate-Range Nuclear Forces (INF) Treaty have altered availability of assets. The RC program is, therefore, likely to be stretched beyond FY 93.

Flexibility

The most immediate advantage of the 3x8 concept and its split-battery operations is flexibility. With the additional firing units, commanders are more capable of providing continuous support to maneuver forces. Previously, a battalion conducting movement had one-third to two-thirds of its units and, therefore, firepower on the road at any time. This often made decisions tough when an immediate need for fire support had to be balanced against a unit's vulnerability or its ability to provide support during a future or more critical phase of the battle.

A 3x8 battalion can move smaller sub-units; it has 12 to 16 tubes to provide fire support, as opposed to 6 or 12 tubes. Finally, the elements move shorter distances and are smaller and more maneuverable, greatly reducing their total time out of action.

A commander also has gained increased flexibility with the additional BCS-equipped fire direction centers (FDCs). Fire supporters can use these computers to share the target computation load of a late-breaking fire plan or shift fires more easily to another portion of the battlefield to meet an unexpected threat. The increase of one FDC per battery also helps continuity of operations when one is put out of action or destroyed.

Increased Firepower

The 3x8 structure can be the force multiplier the maneuver commander needs to help him defeat an enemy that

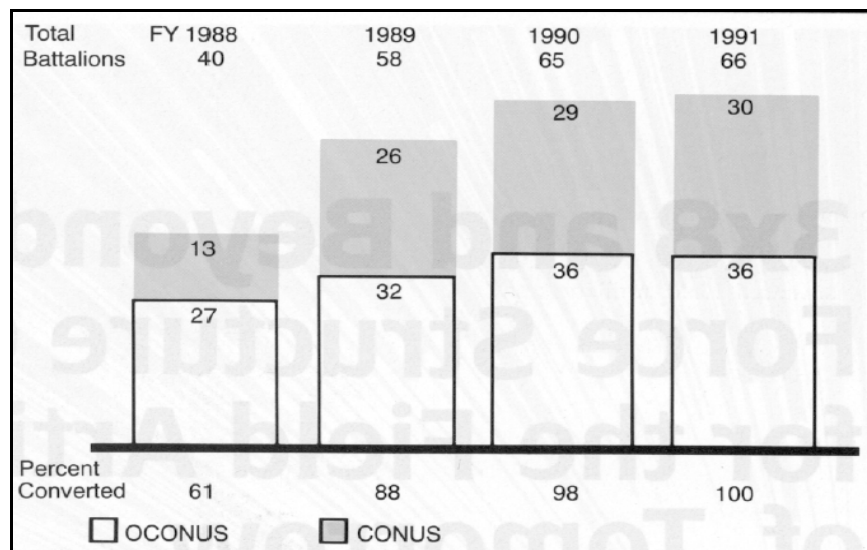


Figure 2: Active Component Battalion's 3x8 Conversion Schedule

FY 1989	CONUS	4th IN Div Arty (Fort Carson, CO) 5th IN Div Arty (Fort Polk, LA) 24th IN Div Arty (Fort Stewart, GA) XVIII Abn Corps Arty (Fort Bragg, NC) 1-77 FA (DS to 194th Bde, Fort Knox, KY) 1-17 FA & 2-17 FA (III Corps Arty, Fort Sill, OK)
	OCONUS	2d ACR & 11th ACR (USAREUR)
FY 1990	CONUS	5-15 FA (Fort Ord, CA)
	OCONUS	2d IN Div Arty (Korea) 1-8 FA (Hawaii)
FY 1991	CONUS	3d ACR (Fort Bliss, TX)
	OCONUS	—

Figure 3: Active Component Cannon Unit 3x8 Conversions Still to be Completed

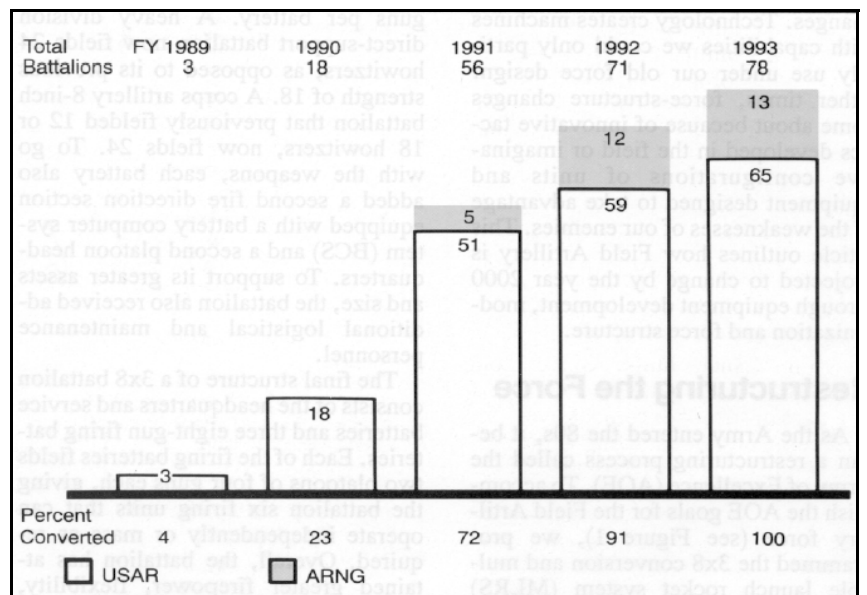


Figure 4: This Reserve Component schedule is being revised, with a Department of the Army decision due in December 1989.

will outnumber him on the battlefield by at least three to one in tanks and seven to one in artillery. The new structure gives the artillery commander the ability to provide continuous, high-volume support. Weapons developments such as the howitzer improvement program (HIP) howitzer and advanced Field Artillery system (AFAS) will further expand the capabilities of 3x8 units as we field these weapons in the 90s.

8-Inch and MLRS in Corps

In a joint action to complete the heavy division restructure, we removed the 8-inch and MLRS composite battalions from division artilleries. We distributed the 8-inch weapons to corps artillery battalions and retained the MLRS battery as a separate battery.

In this structure, we removed the less maneuverable and survivable 8-inch from the divisional force but retained the MLRS battery to provide general support (GS) fires. Figure 5 depicts the new organization and features of the heavy division artillery under AOE.

EAD Transition Plan

Now, what could a battalion commander achieve if you could give him the firepower of his entire battalion in a single weapon? We give the commander that increased firepower in the MLRS. Each self-propelled loader-launcher (SPLL) is a highly automated, self-contained, self-loading vehicle with on-board fire control. Its 12 rockets deliver munitions equal in effect to three volleys of a 155-mm battalion or two volleys of an 8-inch battalion firing dual-purpose improved conventional munitions (DPICM).

The Echelons Above Division (EAD) transition plan takes advantage of this superior system and its developmental Army tactical missile system (Army TACMS). The plan creates more MLRS units through a combination of trading off 8-inch units and reorganizing Lance units. Since both 8-inch and Lance units are nearing the end of their effective combat lives, the plan combines modernizing aging systems with the tremendous advantages of MLRS and Army TACMS.

Our 8-inch and Lance systems are outdated and people-intensive. Each requires more highly trained soldiers to operate the weapons than our newer systems do and offers little protection from enemy direct and indirect fires.



New weapons such as the HIP howitzer will further expand the capabilities of 3x8 units.

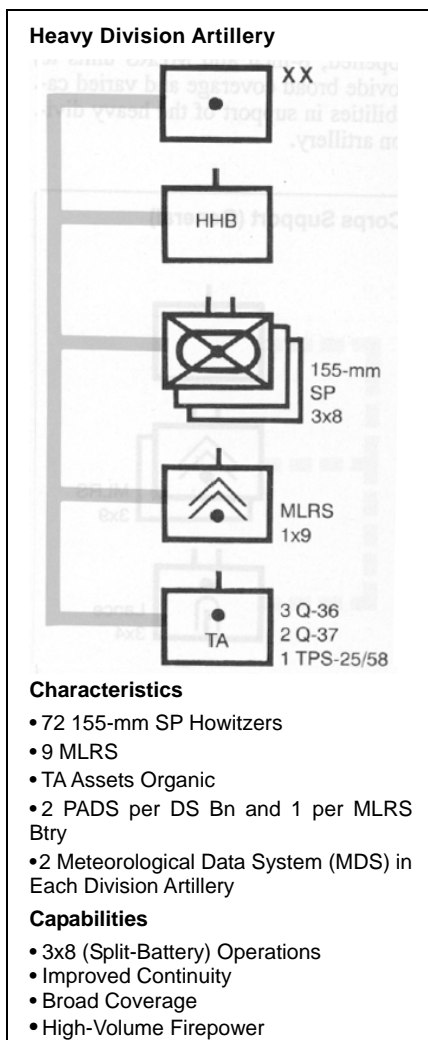


Figure 5: New Organization and Features of the Heavy Division Artillery Under AOE



The 3-21 FA, Fort Polk, Louisiana, fires its final 8-inch rounds before it was inactivated in November 1988.

Both systems move more slowly and require too much time to emplace and prepare for firing. In addition, both require too much crew time to prepare and handle munitions.

On the other hand, MLRS is a highly efficient system, in terms of crew size and number of support personnel. The launchers are fast and highly mobile, and we can employ them autonomously, making them more survivable.

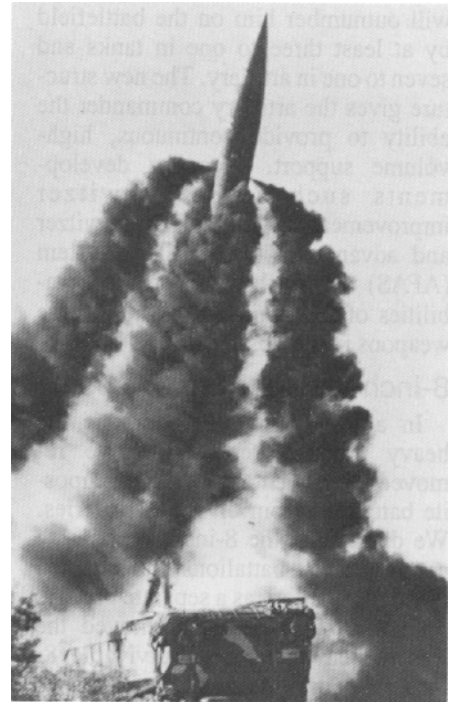


The Army TACMS will allow us to engage enemy second-echelon targets more deeply than before.

Launchers and ammunition vehicles come equipped with material-handling equipment, making resupply faster and less physically demanding. We easily can fire and replace MLRS pods of six rockets each without assembling and preparing them manually.

The Army TACMS munition uses the same launch vehicle with two pods of one rocket each, incorporating a variety of new munitions. When employed at extended ranges, its anti-armor, mine-dispensing and runway-cratering munitions (among others) will allow the Field Artillery to engage enemy second-echelon divisions far deeper than ever before.

Though the specifics of the EAD transition plan are classified, the plan will bring the corps artillery structure to that depicted in Figure 6 (heavy division corps support—habitual) and Figure 7 (corps support—general). Figure 6 shows the heavy division "slice" of corps artillery. The brigade combines the advantages of 155-mm self-propelled, 8-inch and MLRS units to provide broad coverage and varied capabilities in support of the heavy division artillery.



The compression cuts the number of Lance units in half but retains all launchers for an exclusively nuclear role.

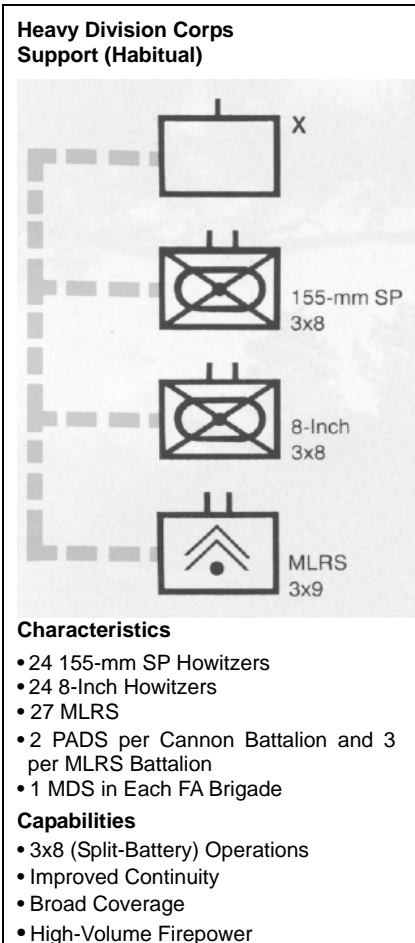


Figure 6: New Organization and Features of the Heavy Division Corps Artillery (Habitual) under AOE's EAD Transition Plan

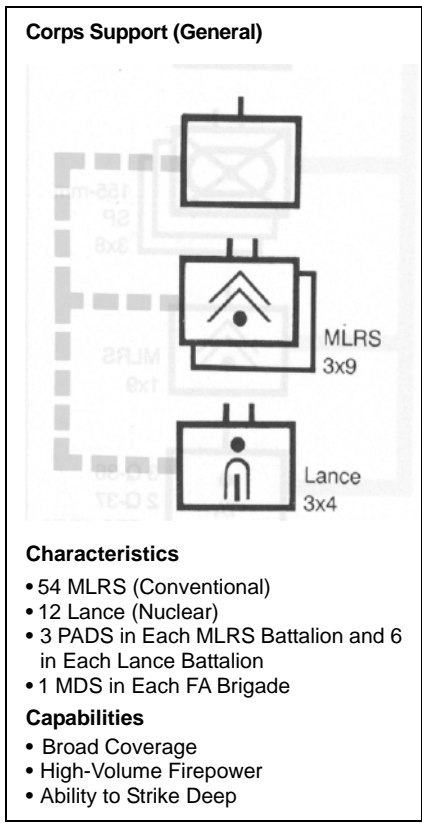


Figure 7: New Organization and Features of the Corps Support (General) Under AOE's EAD Transition Plan

Lance Compression

The Lance compression will complete the restructuring of the corps artillery under the EAD transition. We'll restructure Lance units for an exclusively nuclear role, while the two Army TACMS-equipped MLRS battalions assume the deep-strike conventional role.

Lance units will compress by adding launchers, some command and control and some support from one battalion to the assets of another battalion. Each battalion then will consist of three firing batteries of four launchers, as opposed to the current 3x2 configuration. Though this will cut Lance units in the force in half, the number of launch platforms will be the same and fully capable of accomplishing the nuclear mission until their eventual replacement by a developmental system called "Follow-on-to-Lance" (FOTL).

Mod Plan

Looking even further into the future, the Directorate of Combat Developments in the Field Artillery School is continuing to explore the dynamic process of force modernization. An analysis called the "Field Artillery Modernization Plan" has received conceptual approval by the Chief of Staff of the Army and is awaiting funding. The

Mod Plan (Figure 8) looks to the year 2000 with the following goals: convert the force to a less manpower-intensive cannon system (AFAS) and achieve a two-caliber heavy force (155-mm and MLRS).

INF and MLRS

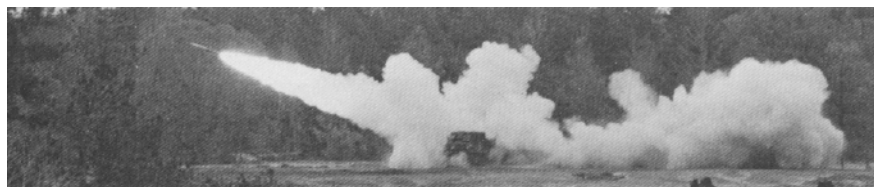
The final impact of the decade of the 80's is the death of the Field Artillery's strategic role. The INF Treaty caused both NATO and the Warsaw Pact to eliminate intermediate-range nuclear delivery systems. As a result, we're disbanding the 56th Field Artillery Command with its 1st, 2d and 4th Battalions of the 9th Field Artillery (Pershing) in Germany and the 3d Battalion of the 9th Field Artillery at Fort Sill, Oklahoma. To somewhat counterbalance the loss of these deep-strike units, we must increase our conventional artillery forces. The obvious system of choice is the MLRS.

Though the classified INF plan is not completed or approved, it's safe to say corps artillery units with MLRS and, eventually, Army TACMS will replace the Pershing units to further bolster Field Artillery firepower throughout the force.

Tomorrow's Force

We can be sure that as we update and replace our aging systems and develop tactics and capabilities in AirLand Battle, force structure will continue to change. As we explore ideas to improve our effectiveness with more firepower in cost-effective, manpower-efficient ways, we develop the powerful systems and challenging tactics of our Field Artillery of tomorrow.

Captain Bernd L. Ingram has been an Organization Integrator for two years in the Force Structure Branch, Organization and Personnel Division, Directorate of Combat Developments, Field Artillery School, Fort Sill, Oklahoma. He served as an assistant S3 and battery commander employing split-battery operations in the divisional composite 8-inch and MLRS battalion of the 1st Armored Division Artillery in US Army, Europe. Captain Ingram is a Distinguished Military Graduate of Stephen F. Austin State University ROTC, Texas. He's also a graduate of the Officer Advanced and TACFIRE Fire Direction Courses, Fort Sill, and the Combined-Arms and Services Staff School, Fort Leavenworth, Kansas.



C/21 FA's MLRS: The obvious choice to increase our conventional artillery punch.

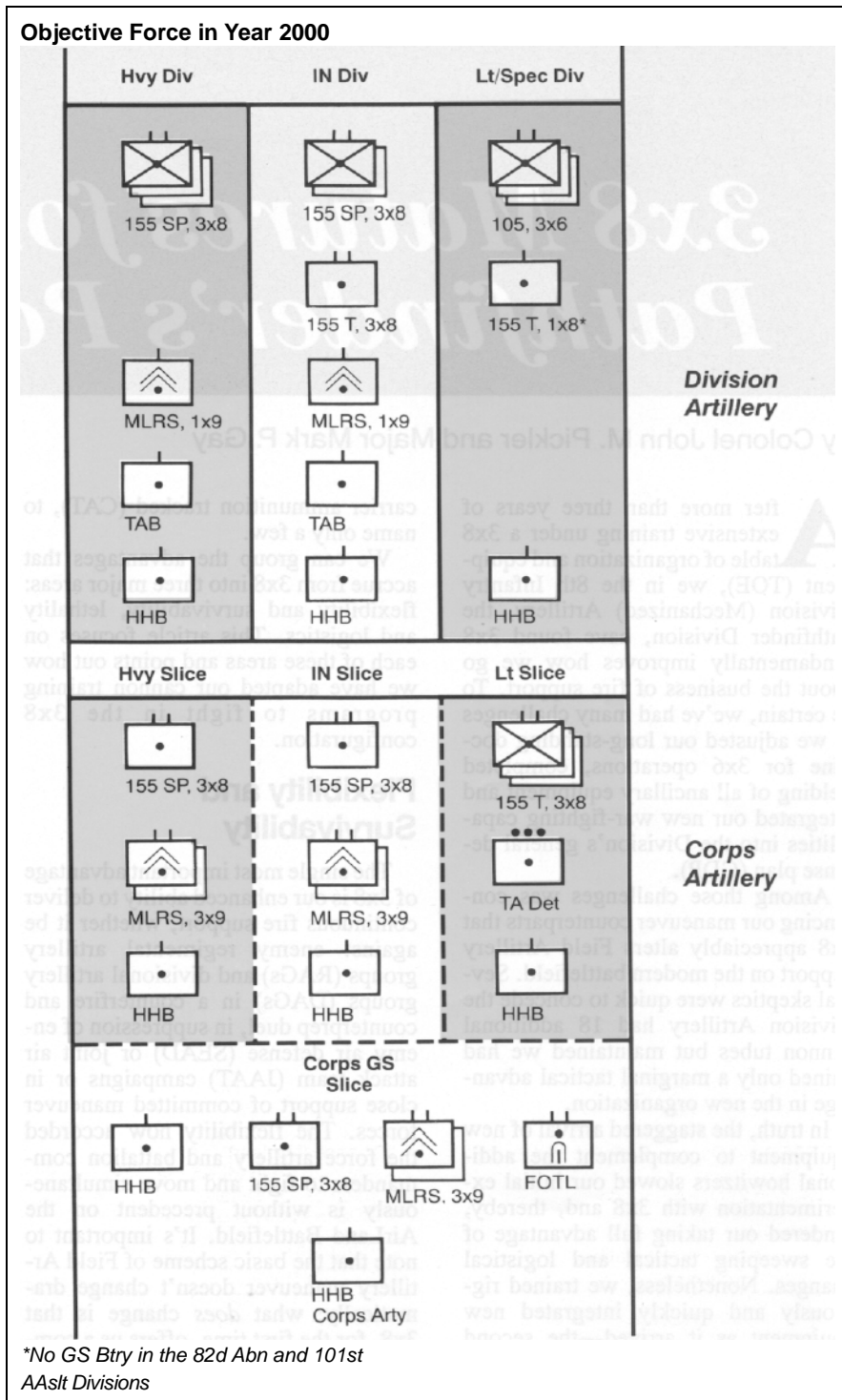


Figure 8: Force Structure of the Mod Plan, Pending Approval

3x8 Matures for Pathfinder's Power

by Colonel John M. Pickler and Major Mark P. Gay

After more than three years of extensive training under a 3x8 table of organization and equipment (TOE), we in the 8th Infantry Division (Mechanized) Artillery, the Pathfinder Division, have found 3x8 fundamentally improves how we go about the business of fire support. To be certain, we've had many challenges as we adjusted our long-standing doctrine for 3x6 operations, completed fielding of all ancillary equipment and integrated our new war-fighting capabilities into the Division's general defense plan (GDP).

Among those challenges was convincing our maneuver counterparts that 3x8 appreciably alters Field Artillery support on the modern battlefield. Several skeptics were quick to concede the Division Artillery had 18 additional cannon tubes but maintained we had gained only a marginal tactical advantage in the new organization.

In truth, the staggered arrival of new equipment to complement the additional howitzers slowed our initial experimentation with 3x8 and, thereby, hindered our taking full advantage of the sweeping tactical and logistical changes. Nonetheless, we trained rigorously and quickly integrated new equipment as it arrived—the second position and azimuth determining system (PADS) per cannon battalion, the battery computer system (BCS) and the

carrier ammunition tracked (CAT), to name only a few.

We can group the advantages that accrue from 3x8 into three major areas: flexibility and survivability, lethality and logistics. This article focuses on each of these areas and points out how we have adapted our cannon training programs to fight in the 3x8 configuration.

Flexibility and Survivability

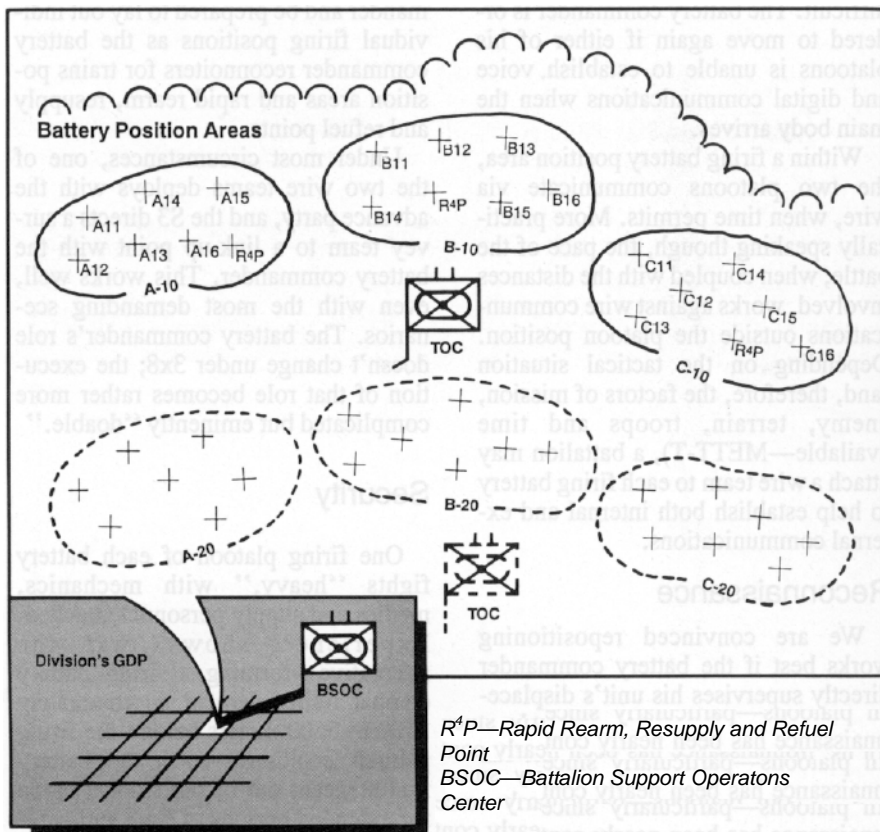
The single most important advantage of 3x8 is our enhanced ability to deliver continuous fire support, whether it be against enemy regimental artillery groups (RAGs) and divisional artillery groups (DAGs) in a counterfire and counterprep duel, in suppression of enemy air defense (SEAD) or joint air attack team (JAAT) campaigns or in close support of committed maneuver forces. The flexibility now accorded the force artillery and battalion commanders to fight and move simultaneously is without precedent on the AirLand Battlefield. It's important to note that the basic scheme of Field Artillery maneuver doesn't change dramatically; what *does* change is that 3x8, for the first time, offers us a command and control system that allows us to do what we have advertised for years: split-battery operations.

Battery Position Area

The most effective use of 3x8 during defensive operations centers on the battery position area assigned by the battalion S3, based on the scheme of supported maneuver forces. We select platoon firing positions within each battery position area. Depending on the tactical situation, a firing battery commander may displace within his assigned position area by platoon, with the stationary platoon's responding to calls for fire from well-prepared positions and retaining digital communications with the tactical operations center (TOC). Besides decreasing the need for hipshoots, the battery commander can "stand tough" and continue his fire support role well forward, conducting survivability moves of approximately 1500 to 2500 meters to alternate positions in response to a verified enemy counterfire capability. When neither platoon is moving, we anticipate the dispersion between them to be about 800 to 1500 meters.

Of course, it's seldom possible to clear all the terrain in the battery position area for occupation. The task is particularly difficult for general support and general support reinforcing artillery units that have no direct communications with the maneuver forces that control the "real estate."

In a rapidly moving offensive situation, assigning battery position areas



Based on the maneuver commander's scheme, the battalion S3 assigns a position area from which a battery selects its platoon firing positions.

serves as a useful reconnaissance orientation method for the battery commander. But he doesn't have enough time to survey and prepare six or seven platoon locations. (The same holds true in a fast-action defensive battle over unfamiliar terrain.) Accordingly, the commander may opt to assign platoon positions and "leapfrog" among them. Whether he uses the battery position area or its modified platoon derivative, the concept of leapfrogging platoons remains the essence of 3x8 tactics.

Weather and terrain are significant when discussing Field Artillery employment and underscore the enhanced flexibility provided by 3x8. Especially here in Europe, where GDP sectors are snowbound for extensive periods during the winter and competition for woodlines is intense among combat and combat support forces, Field Artillerymen must capitalize on the advantages of using urban terrain. Many of the small towns and villages near the border are perfect for rapid and well-camouflaged occupation by a single firing platoon and offer some measure of survivability.

Almost 75 percent of the urban areas our platoons have occupied in the past

three years could not support the more cumbersome six-gun batteries. Moreover, urban positions that offer extremely limited fields of fire for maneuver direct-fire systems are ideal for Field Artillery pieces.

The battalion commander (or S3) should direct movement between designated battery position areas in response to the ebb and flow of the maneuver battle. Displacement, again, must be by platoon. In this case, firing

platoons from the same battery may be separated temporarily by distances of up to six or seven kilometers. The technique is quite similar to the maneuver "bounding overwatch" tactic and helps the firing battery and the battalion stay in the fight continuously.

We strive to have the displacing platoon establish digital communications with the battalion fire direction center (FDC) before the second platoon starts moving. But exigencies of the battlefield



Almost 75 percent of the urban areas we now occupy couldn't support our six-gun batteries.

may demand we resort to voice communications for a period of time.

If the battalion is receiving reinforcing fires from another artillery battalion, the S3 must carefully orchestrate that unit's repositioning as well, ensuring continuous mixed-caliber support throughout the battlefield. To help with both technical and tactical fire control, the S3 requires two artillery fire unit updates from each platoon FDC. The first update occurs as the unit enters the grid coordinates and azimuth of fire for its next firing position and declares a period of time it will be moving, and the second when the platoon is ready to resume firing from its new position. Updating the tactical fire direction system (TACFIRE) data base this way helps the fire direction officer (FDO) select firing units for pre-planned targets and schedules of fire.

Communications

Similarly, we must consider unique factors in our communications. Some wartime defensive sectors are compartmentalized by hill masses, thick forests, urban areas and low-lying river valleys. Communications simply aren't the same as they are at the National Training Center, Fort Irwin, California.

Battery commanders should try to communicate with the TOC during the reconnaissance of each platoon's subsequent position area. Upon occupation, each FDC section erects an OE-254 antenna, although cables are not connected to the radio sets unless communications with the TOC proves

difficult. The battery commander is ordered to move again if either of his platoons is unable to establish, voice and digital communications when the main body arrives.

Within a firing battery position area, the two platoons communicate via wire, when time permits. More practically speaking though, the pace of the battle, when coupled with the distances involved, works against wire communications outside the platoon position. Depending on the tactical situation (and, therefore, the factors of mission, enemy, terrain, troops and time available—METT-T), a battalion may attach a wire team to each firing battery to help establish both internal and external communications.

Reconnaissance

We are convinced repositioning works best if the battery commander directly supervises his unit's displacement. Our experience confirms, at least for us, that the battery commander can and *should* perform reconnaissance for both platoons—particularly since reconnaissance has been nearly continuous during our maneuver exercises thus far.

The battery commander selects the initial firing positions within the position area assigned by the TOC, confirms or modifies (in accordance with the battalion commander or S3) his designated azimuth of fire and verifies each platoon's communications profile. The gunnery sergeant from each platoon (or the platoon sergeant) should accompany the battery commander

and be prepared to lay out individual firing positions as the battery commander reconnoiters for trains position areas and rapid rearm, resupply and refuel points.

Under most circumstances, one of the two wire teams deploys with the advance party, and the S3 directs a survey team to a link-up point with the battery commander. This works well, even with the most demanding scenarios. The battery commander's role doesn't change under 3x8; the execution of that role becomes rather more complicated but eminently "doable."

Security

One firing platoon of each battery fights "heavy," with mechanics, medics and supply personnel attached. Experience shows that the alternative—forming a firing battery combat trains element approximately 1500 to 2500 meters behind the firing platoon positions—takes the battery first sergeant out of the tactical battle for extended periods of time and compounds the command and control and security problems. The battlefield demands on ammunition personnel preclude them from augmenting battery or platoon security operations, as they are on the road continually.

Understandably, there are security risks for both platoons, particularly for the light platoon. We try to minimize these risks by emphasizing proficiency with our crew-served weapons.

Commanders establish field storage locations at their heavy platoon's locations, although each platoon must be adept at executing all nuclear and associated tasks. Once chemical release is authorized, we allocate each firing battery one heavy expanded mobility tactical truck (HEMTT) to transport chemical weapons and position that vehicle with the heavy platoon.

Lethality

An obvious advantage is that 3x8 increases the battalion's firepower by one-third, without an appreciable rise in the command and control or administrative and logistical structure. But this enhanced lethality extends beyond simple numbers; it grows from our improved capability to be at the right place at the right time with the right bullets.



Battery C, 4-29 FA, emplaces a howitzer section and associated CAT in a German village.



In extended combat, we can't carry everything we need to shoot. We must rearm several times a day.

Ammunition

Extended combat with a high controlled supply rate (CSR) presents real logistical challenges, challenges probably unmanageable with six-gun batteries. Put simply, we can't carry everything we need to shoot, and unless we rearm several times each day, we could end up with empty howitzers very quickly.

As an adjunct to our ability to move with greater flexibility, our recently acquired ability to rearm more frequently (aided by the survivability and mobility of the CAT) is a significant step in the right direction. We can move and rearm one platoon, whenever necessary while the other continues to fire, thereby guaranteeing our lethality throughout the battle.

Nuclear Fires

Our ability to provide nuclear fires also is improved somewhat. By pushing our prescribed nuclear load forward to either of the two firing platoons in each battery, we are far more likely to have howitzers positioned to provide timely nuclear fires than we ever were in the past. In addition, the identification and preparation of supplementary positions for each firing platoon ensure we will be able to range chemical and nuclear targets from offset positions, when necessary.

Flexible Power

While the platoons are capable of autonomous operations for limited periods, we don't intend to fight them as mini-batteries, except under the most extreme tactical conditions. Our battalions wargame and plan two levels down, both to capture the inherent flexibility offered by the platoons and

to ensure no more than 50 percent of each battalion's firing units move simultaneously.

Our battery commanders are critical "linchpins" in both the tactical and logistical operations of their units, as they have always been. When not reconnoitering positions, they coordinate positions for rapid rearm, resupply and refuel points with the TOC and battalion support operations center and relay the current friendly and enemy maneuver situations to subordinates (confirming the updates passed to each FDC via the variable format message entry device—VFMED—in the TOC). They also supervise the battery trains and walk the "line of metal" with their platoon leaders. The commander's presence at the critical point is extremely important, as our policy of assigning the most experienced lieutenants to fire support positions leaves us with our more junior officers in the firing platoons.

Logistics

We strongly support the concept of establishing forward resupply points for units enroute to position areas. We extend the rapid rearm, resupply and refuel point concept (or logistics package—Logpac) to our headquarters batteries also. Again, the battery commanders coordinate the sites for those points with the TOC. Meanwhile, the service battery commander reconnoiters his position, advises the S3 of site suitability and recommends an alternate location, if necessary.

The S3, in coordination with the battalion commander, establishes resupply priorities in the same way he establishes priorities for survey support. As a rule, our units plan a rapid rearm, resupply and refuel point whenever


possible during platoon displacements to position areas, with priority on Class V supplies.

The battalion also maintains its battalion support operations center well to the rear and as close to the brigade support area as the terrain and situation permit. Whenever possible, the battalion support operations center is in an urban area, both to take advantage of available cover and concealment and to have ready access to major transportation and communications networks.

The service battery commander operationally controls the battalion support operations center under the battalion executive officer's supervision. An S1 and S4 representative operate forward in the TOC, where they have up-to-date information with which to plan and coordinate. With assistance from the operations and intelligence section, these representatives intensively track the threat to their forces in the brigade support area and maintain communications with the support center to stay abreast of the long-range support picture.

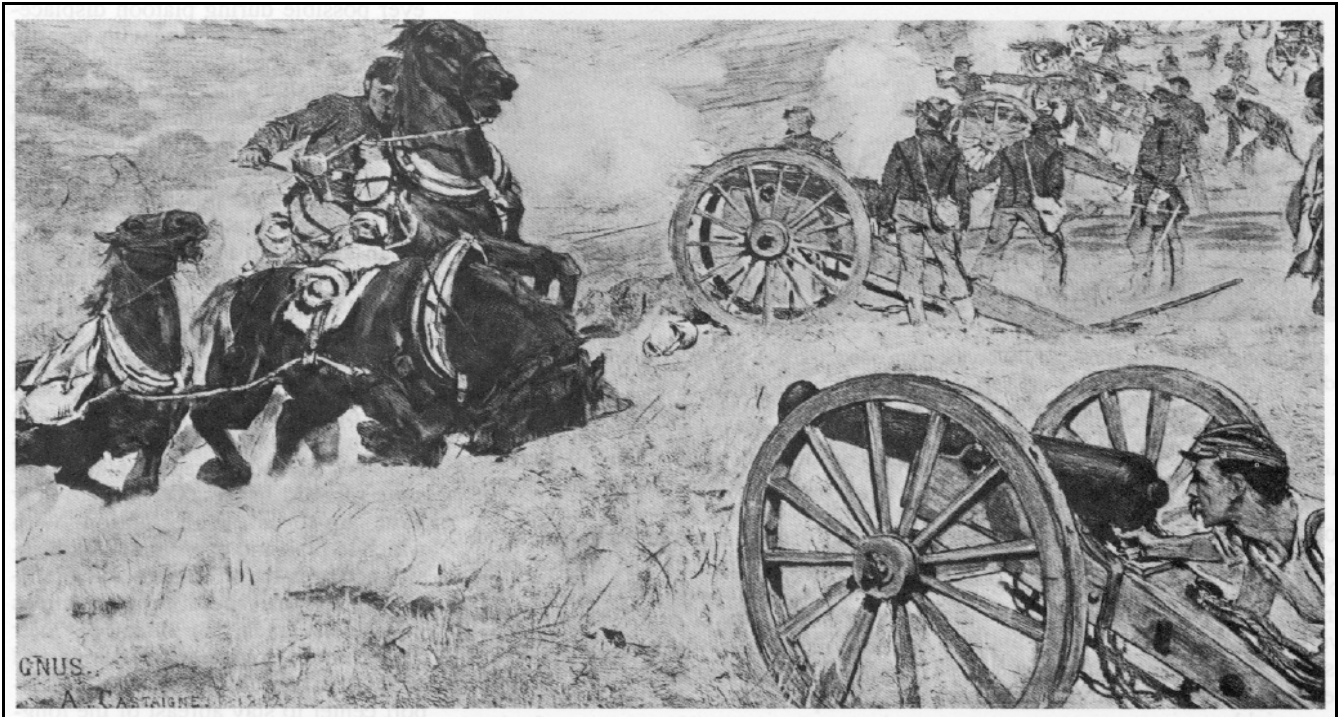
Conclusion

Our 3x8 operations offer a progressive approach to the battlefield of tomorrow, while significantly enhancing combat power today. We claim no monopoly on the topic, though we've taken advantage of every training opportunity to validate the tactical concept under conditions closely approximating those we expect to see in combat.

The 8th Division Artillery looks forward with Redlegs everywhere to further discussions as 3x8 operations continue to mature as we field additional equipment throughout our Army. 

Colonel John M. Pickler commands the 8th Infantry Division (Mechanized) Artillery in US Army, Europe. He commanded the 2d Battalion, 81st Field Artillery, 8th Division, and C Battery, 2d Battalion, 19th Field Artillery, 1st Cavalry Division, the latter in Vietnam. Colonel Pickler also served as Chief of Staff of III Corps Artillery, Fort Sill, Oklahoma.

Major (P) Mark P. Gay is the 8th Division Artillery S3. In June, he'll assume command of the 6th Battalion, 29th Field Artillery, also part of the 8th Division. Major Gay commanded firing and target acquisition batteries in the 24th Infantry Division Artillery, Fort Stewart, Georgia.



The Guns of Malvern Hill

by Major Jerre W. Wilson

Few instances of American history more vividly demonstrate the value of Field Artillery better than the Battle of Malvern Hill. Occupation of this relatively small defensive position by the Army of the Potomac gave rise to unity of command and a massed fire capability unequaled during the Civil War. Based on a comparison of casualties, this last major action of Major General George B. McClellan's Peninsula Campaign was clearly a Union tactical victory. However for the South, it meant the threat to Richmond from McClellan's vast army was over. This article examines the employment of artillery during this pivotal conflict.

Background

Late June 1862 brought an end to a series of struggles known as the Seven Days' Battle. Since the first of June, General Robert E. Lee had been steadily driving McClellan away from Richmond in his first action as commander of the Army of Northern Virginia. The morning

of 1 July 1862 found the bulk of the Union forces assembled on a 150-foot eminence 12 miles southeast of Richmond, known as Malvern Hill. This open plateau, about one-half mile wide and one and one-half miles long, was essentially surrounded by either marshes or timber. The tangled undergrowth and limited road network made artillery emplacement and infantry movement difficult, if not impossible, while the gradual incline of the northern slope afforded an excellent field of fire for the defenders.

Union Positions

McClellan, aided by his capable corps commander Major General Fitz-John Porter, selected the critical positions for the Federal artillery and infantry. Having completed the preparations, McClellan boarded a ship to select the final locations necessary to shift his base of operations on the James River. He would return to the field around mid-afternoon for a brief period. He selected the divisions of Sykes, Morell and Couch to form the front line while he held the corps of Heintzelman,

Franklin and Sumner in ready reserve. The main elements of the first line of defense were the abundant guns of the divisional batteries of the Field Army: 12-pounder Napoleons, 10-pounder Parrots and 3-inch rifles. These weapons were under the command of Brigadier General Charles Griffin but were generally under the care and supervision of Captain William Weeden.

Placement of the remainder of the Union artillery was the responsibility of Colonel Henry J. Hunt, the able commander of the Artillery Reserve. Hunt employed his one hundred-odd cannon almost hub-to-hub across the summit, aiming primarily north and northwest. The Artillery Reserve included 34 light 12-pounder cannon, thirty 3-inch rifles, ten 10-pounder Parrot rifles, twenty 20-pounder Parrots and six 32-pounder howitzers. His biggest problem was finding positions for all his cannon. Further supporting the forwardly deployed artillery was Colonel Robert O. Tyler's 1st Connecticut Heavy Artillery—five 4.5-inch Rodman



Major General George B. McClellan posts his Union batteries at Malvern Hill, Virginia.

rifles, five 30-pounder Parrots, two 8-inch howitzers and two 10-pounder Whitworth rifles. To the credit of the Union cannoners, they had to drag most of these guns by hand to the top of the hill. By the start of the battle, almost 250 cannon were assembled on Malvern Hill.

Even more fire support was provided by five Federal gunboats stationed on the James River. Confederate Major General D. H. Hill recalls, "The howling gun-boat shells were usually harmless to flesh, blood and bones, but they had a wonderful effect upon the nervous system."

The Union guns were placed so as to sweep all the approaches: roads, ravines and fields. Careful planning and positioning by Hunt and others ensured that 20 to 30 guns could be concentrated on any position of the battlefield. The Union covered the left particularly well by cannon, while on the right and front it constructed an abatis (a defensive obstacle formed by felled trees with sharpened branches facing the enemy). All the artillery positions were well-guarded by infantry, making Malvern Hill a virtual fortress. D. H. Hill noted that "Tier after tier of batteries were grimly visible on the plateau, rising in the form of an amphitheater."

Confederate Preparation

Lee met with his lieutenants on the morning of 1 July, at which time he heard several different plans. Concerned about the feasibility of attacking such a defensible position, D. H. Hill suggested that "If General McClellan is there in force, we had better let him

alone." Laughing, Major General Longstreet responded with "Don't get scared now that we have him whipped," and proposed a general assault. Stonewall Jackson suggested a flanking movement to the Confederate

left. Lee recognized this was his last chance to destroy McClellan's Army before it reached the James River. He knew the risks involved but thought an assault worth a try. Ultimately, Lee followed General Longstreet's advice and developed a plan that depended on the Confederate artillery to "rake" or soften the Union line immediately before the infantry assault on the well-defended positions.

Longstreet indicated he had found a terraced knoll suitable for artillery positioning to enfilade the Union defenses. He postulated that with 40 guns on the right and twice that many on the left, the converging fires would break open the Union lines. In reality, no such ground existed. Any terrain suitable for artillery emplacement was well-covered by the hundreds of Union cannon assembled on the hill.

Lee then issued his division commanders one of the most controversial orders of his career—"Batteries have been established to rake the enemy's



The Union positioned 250 cannon on Malvern Hill, dragging most of the guns up by hand.



Colonel Henry J. Hunt, 1861

line. If it is broken, as is probable, Armistead, who can witness the effect of the fire, has been ordered to charge with a yell. Do the same. By order of General Lee." The Southern cause therefore rested on the actions of one brigade commander who couldn't fully see the battlefield nor communicate with all the forces involved. Southern infantrymen also would soon discover that batteries couldn't be established to support their advance.

Terrain and communications weren't the only problems the Confederate artillery was to face that day. The command structure of "Lee's Long Arm" would neither be responsive nor coordinated enough to implement his plan. The divisional batteries were not organized into battalions but acted independently at the discretion of the division commander.

Brigadier General Pendleton, Lee's Chief of Artillery, had a large artillery reserve organized in four battalions of several batteries each, but few of his guns fired during this battle or any other of the Seven Days' conflict. Pendleton said he spent the entire day looking for orders and positions for his units but could find neither. Colonel Crutchfield, Jackson's Chief of Artillery, was sick and absent from the field, with no replacement designated. The Confederate artillery was desperately in need of leadership, but apparently no one recognized this critical flaw nor sought the advice of the senior artillerymen during the planning process for the assault on Malvern Hill.

Artillery Prelude to the Battle

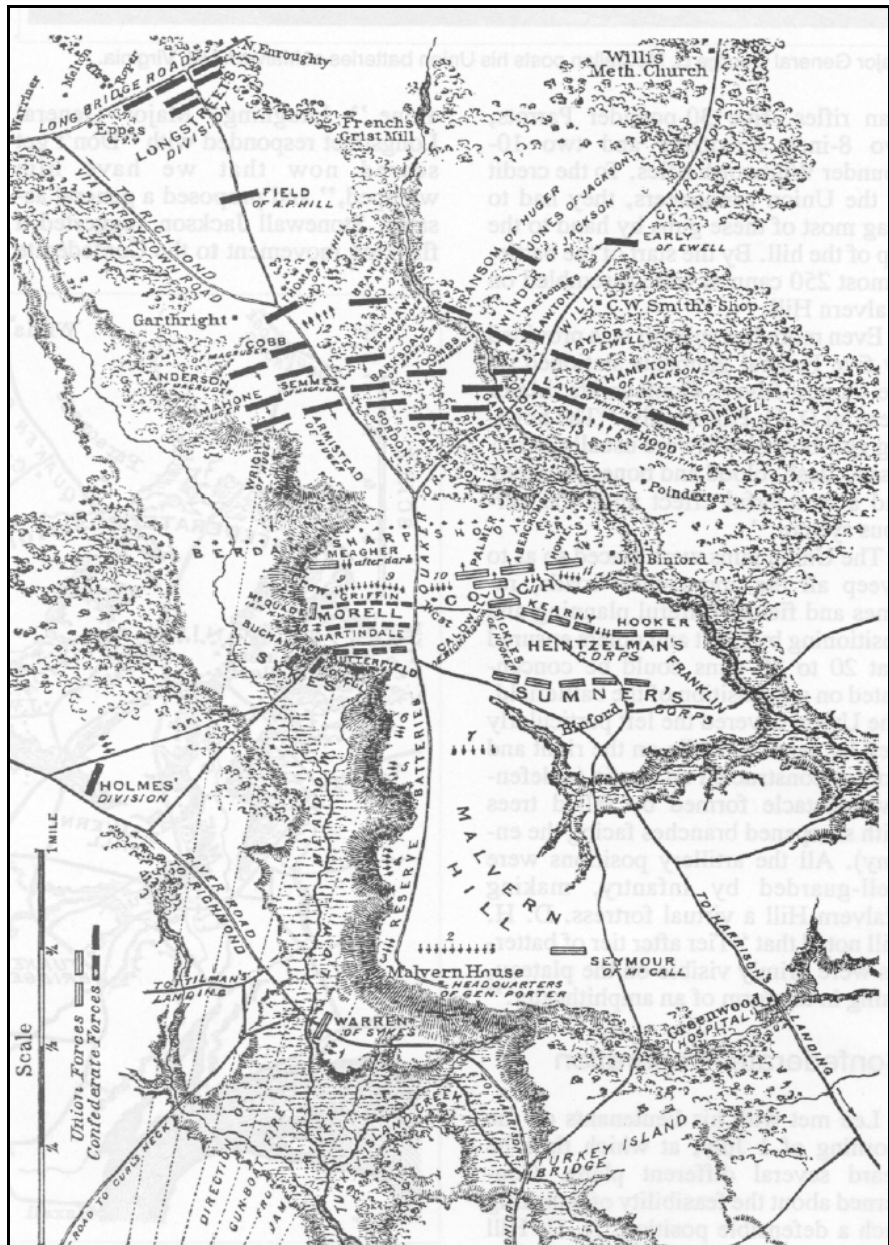
At about 1300 hours, the Confederate artillery opened fire to soften the Union lines. One by one, batteries were brought up on both flanks in piecemeal fashion, only to be overwhelmed by superior, massed Union fire. On the Confederate left flank, the batteries of Poague, Balthis and Carpenter went into action, but all had to retire quickly because of the intense Union counterbattery fire. Because of a shortage of ammunition and horses, Wooding's Danville Artillery could get only one section in position but remained on the field all afternoon, despite heavy losses. Armistead, apparently worried about his responsibilities for signaling the attack, requested artillery to his front and

received the batteries of Grimes, Moonman and Pegram. Each moved into position but fired at different times.

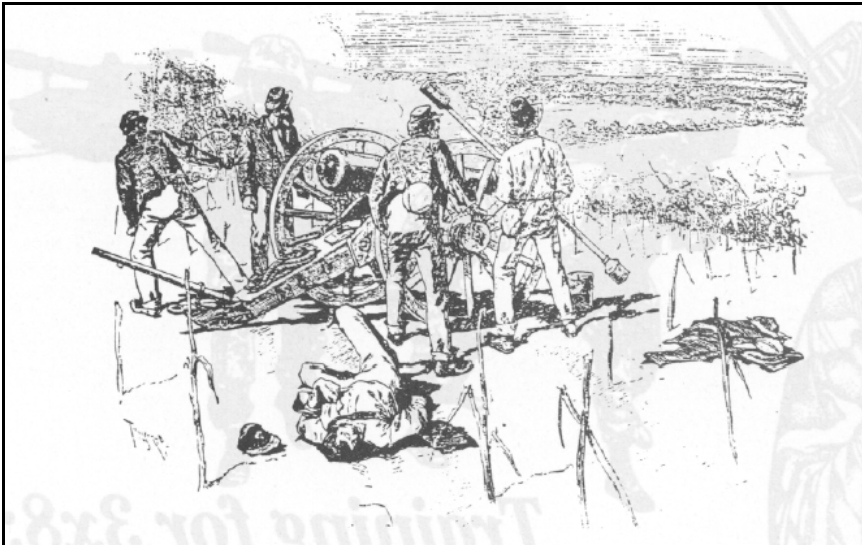
The dedication shown by Captain William Pegram of the Purcell Virginia Artillery was typical of the valiant effort of the Confederate artillerymen who did manage to get into the battle. Pegram had fought in every action of the Seven Days' Battle and had had more than half of his men killed or wounded. By mid-afternoon, only one gun of his battery remained because of the intense Union counterbattery fire. Pegram, himself, helped to service that piece.

At times, more than 50 Union guns concentrated on a single Rebel battery, rendering it useless before moving on to another target. Instead of firing 100 guns, the Confederates could muster only about 20 at a time. The Union fire was so intense the Rebels thought much of it was from the river gunboats. In reality, it was from Tyler's siege guns. The gunboats actually contributed little to the outcome of the battle.

This one-sided artillery exchange continued until about 1530 hours. D. H. Hill wrote "The firing from our batteries was of the most farcical character."



McClellan won a tactical victory at Malvern Hill, but his threat to Richmond was over.



A Union gun at Malvern Hill where the artillery saved the Army of the Potomac from annihilation.

It became obvious the Confederate artillery wouldn't break the Union line in preparation for the planned frontal assault.

The Assault

At about 1500 hours, Lee decided to abandon the attack. He advised Long-street of his change in plans but apparently didn't notify the other generals as the conflict appeared to be subsiding. As Federal sharpshooters were approaching the Confederate skirmish line, Armistead ordered portions of his command to drive the intruders back. Major General J. B. Magruder mistakenly believed Armistead had made significant advances and reported so to Lee. Lee, forgetting his original order was still in effect, ordered Magruder to press forward and follow up on Armistead's success. D. H. Hill, thinking the action was the signal for the attack, ordered his division forward and thus began the ill-fated assault on Malvern Hill.

Unsupported, Hill was beaten back. He requested reinforcements and received Jackson's and Ewell's divisions. By now, Magruder was attacking along with Brigadier General A. R. Wright and Armistead. The Rebel Army was in motion but, like the artillery preparation, was spasmodic and uncoordinated. The Union guns were able to shift from one threat to another, defeating each in turn. Wright thought "The loud and incessant roll of artillery and small-arms were enough to make the stoutest heart quail."

Although grossly lacking in artillery support, the Confederate soldiers continued to charge the heavily fortified Union positions. Porter noted "The artillery...mowed them down with shrapnel, grape and canister; while our infantrymen, withholding their fire until the enemy was within short range, scattered the remnants of their columns."

The resources of the North must have seemed limitless to the Southern soldiers assaulting the hill. Fresh Union regiments immediately replaced those on the front whose ammunition was exhausted. Similarly, Hunt moved up batteries of the Artillery Reserve to replace the batteries on the front line. Twice while supervising the firing, Hunt's horse was shot from under him. The South dearly missed an artilleryman of Colonel Hunt's ability.

The few Confederate soldiers who made it near the Union guns were eventually beaten back, many at bayonet point. After the attackers had retreated, Hunt moved up his 32-pounder howitzers and continued the cannonading well into the night.

When the battle was finally over, the field was strewn with the dead and wounded. The Confederates suffered more than 5,500 casualties, mostly from the divisions of D. H. Hill, Huger and Magruder. The Army of the Potomac lost approximately one-third of that number.


At dawn on 2 July, Union Colonel William Averell, who had been left in charge of the rear guard, saw the true effect of the cannon. He noted that

"More than 5,000 dead and wounded men were on the ground in every attitude of distress. A third of them were dead or dying, but enough were alive and moving to give the field a singularly crawling effect."

Summary

At Malvern Hill, the Union artillery saved the Army of the Potomac from annihilation. McClellan was allowed to continue his Army's retreat to the James River, board ships and, eventually, return to Washington for reorganization. Although this was clearly a Union victory, McClellan viewed it as simply another escape from disaster in the face of overwhelming odds. He would later be the target of much criticism and even accused of treason for not continuing his push toward Richmond. He continued to believe he was outnumbered almost two-to-one throughout the Peninsula Campaign.

The Confederate forces had almost the same amount of artillery for the battle, but terrain restrictions and a fragmented command structure prevented their effective use. After Malvern Hill, Southern leaders began to reconsider their organization and employment of artillery. McClellan's forces clearly had demonstrated the need for well-coordinated fire support and the importance of integrating all the artillery in the tactical plan.

In the final analysis, Malvern Hill was a battle that should never have been fought. For as D. H. Hill surmised, "It was not war—it was murder." 

Major (P) Jerre W. Wilson is assigned to the Environmental Services Division, Operations Directorate, the Joint Staff, Washington, D.C. He has served in a variety of positions with the 2d Infantry Division Artillery, Korea; 2d Battalion, 92d Field Artillery, 42d Field Artillery Brigade, US Army, Europe; and the 4th Battalion, 4th Field Artillery, and 75th Field Artillery Brigade, both of III Corps Artillery, Fort Sill, Oklahoma. He taught at the US Military Academy, West Point, and is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas. Major Wilson's great-grandfather was wounded during the Seven Days' Battle while fighting with the 10th Alabama Regiment of General Longstreet's command.



ILLUSTRATION BY BOBBY HILL



Training for 3x8: The Shape of things to Come

by Staff Sergeant Glenn A. Garrison

After implementing the 3x8 platoon concept, we, as an M109A2 battery in the 4th Battalion, 3d Field Artillery Regiment, in Northern Germany, experienced the expected personnel and equipment adjustments. In addition to these problems, we encountered a severe deficiency: we lacked the training to implement the new concept. This need for training ranged from the commander down to the powder man.

The 3x8 concept is a stepping stone to the eventual fielding of semiautonomous sections equipped with improved howitzers and support vehicles. We, as leaders, must ensure our Field Artillerymen are prepared to make maximum use of these assets. We must implement effective and far-reaching training plans so Field Artillery NCOs are "on line" with their combat-arms counterparts.

This training should address not only artillery-related subjects, but also areas beyond those usually associated with 13B or 13E skill levels one through four, such as survivability, tactics and armor movement. On the battlefield of the 1990s, we could have no platoon sergeant, first sergeant, platoon leader

or commander readily available to guide the section chief. He'll have to shoot, move, communicate and survive much like his Infantry and Armor brothers. Many Field Artillery leaders lack the training to provide fire support under the potentially difficult and hazardous situations they'll encounter during semiautonomous operations.

The training available for the Field Artillerymen in the NCO education system (NCOES) is primarily geared toward gunnery or cannoneer skills, touching only briefly on survivability, defense, vehicle navigation and tactics. To offset these deficiencies, our battery developed a training program for our 3x8 transition. The program began



All howitzer sections must train soldiers in defensive measures, such as direct firing (4-3 FA).

with training for the officers and senior NCOs and currently involves training section chiefs, gunners and ammunition team chiefs. This training has significantly improved our discipline and proficiency in many areas, including critical non-artillery tasks.

Defense and Survivability

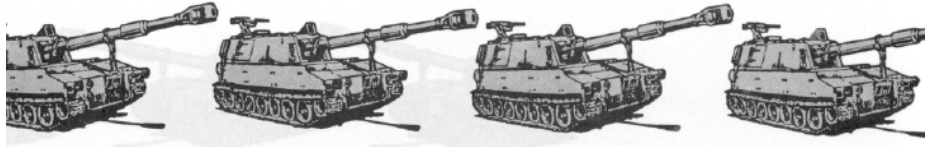
With the tremendous counterbattery fires available to the Threat forces, our commanders or platoon leaders have three options: move, disperse or harden. They usually prefer the option to move; however, the results could be that every element moves to escape counterbattery fire or other threats to the platoon, and no element is firing. That situation would be totally unsatisfactory. Therefore at some time, we're going to have to endure the brunt of the enemy's firepower or fend off a ground attack.

Our solution was to implement a combination of dispersion and hardening. However, with the increased width of platoon fronts (up to 700 meters), the platoon's command and control becomes severely taxed, and defense takes on an entirely new aspect. These problems are by no means insurmountable, and with training, especially at section level, we solved them.

Section-Level Training

The section-level training must include battle drills, and section NCOs must be well-versed in the entire concept of platoon defense. Each section must be able to support other sections at greater distances and defend itself. This may sound like "Old Hat." But infantry skills in defense planning (dead space, fields of fire, avenues of approach, weapons capabilities and limitations, etc.) and non-standard howitzer direct-fire techniques (Killer Junior, ricochet, use of smoke, etc.) are too often considered non-essential in Field Artillery training. The increased distance between sections will greatly reduce the effectiveness of the reaction force, and section NCOs will have to organize and direct their section members to perform as infantrymen to maintain the platoon's defense integrity.

The sections also must train in Armor battle drills—down to the powder man. We must train and constantly rehearse

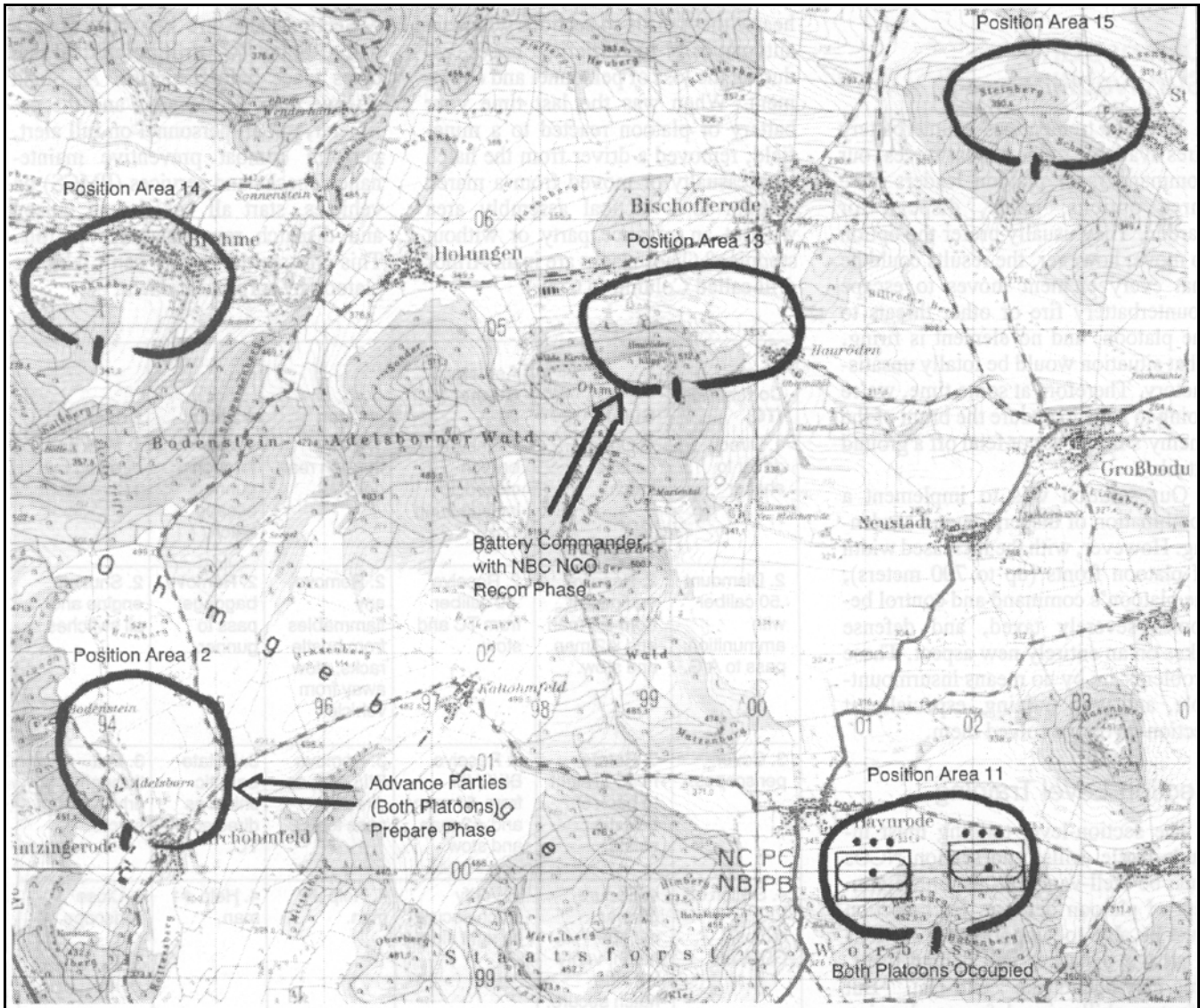


these drills so sections will react automatically to battlefield crises, reducing the loss of personnel and equipment. When was the last time your battery or platoon reacted to a minefield, removed a driver from the hatch as a casualty or moved from a march column to a tactical assembly area without an advance party or without stopping? (Those tasks are in an Armor drill called Column to Coil.)

Sections also are key players in a daily "Stand To" drill in the field that takes place before sunrise. At Stand To, we man all weapons and the perimeter, put all personnel on full alert, perform combat preventive maintenance checks and services (PMCS) on vehicles, start all vehicles in unison and dispatch reconnaissance patrols. This ensures the enemy can't take the platoon by surprise at dawn.

Track Commander (TC)	Gunner	Assistant Gunner (A/G)	#1 Man	#2 Man	Driver
1. Direct driver to shelter	1. Open escape hatch.	1. Ensure breech closed, to include firing lock.	1. Exit through rear door.	1. Exit through gunners escape hatch.	1. Park as directed by TC.
2. Dismount .50 caliber with ammunition; pass to A/G.	2. Receive equipment from #1 man and #2 man and stow.	2. Receive .50 caliber from TC and stow.	2. Remove any flammables from bustle racks; stow away from vehicle.	2. Remove baggage; pass to gunner.	2. Shut off engine and all switches.
3. Cover periscopes.	3. Rotate head of sight to back of ballistic shield.	3. Receive BII/OVM from #1 man and #2 man and stow.	3. Remove BII/OVM, as directed; pass to AG.	3. Rotate ballistic shield as directed by TC.	3. Exit through driver's hatch.
4. Switch off VIC 1, radios, GDU, etc.	4. Secure gunner escape hatch; verify left side hatch secure.	4. Verify hatch secure on right side.	4. Help #2 man.	4. Help #1 man.	4. Close periscope.
5. Supervise activities.	5. Brace.	5. Brace.	5. Reenter through rear door; secure door.	5. Reenter through gunner's escape hatch.	5. Cover direct-fire scope shield, if not done.
6. Close TC hatch; secure upon completion of activities.			6. Brace.	6. Brace.	6. Enter through driver's hatch; secure hatch and brace.
7. Drop to floor and brace.					

Section Battle Drill for Strike Warn



A movement matrix for battery RSOP drills minimizes face-to-face or FM communications. The commander assigns potential position area numbers and issues the appropriate command: i.e., "Prepare Position 12." This triggers the dispatch of advance party (or parties) to that position. At the appropriate time, the commander simply commands "Occupy Position 12," and the move is executed. Rate or route of march and other critical information is passed on a case-by-case basis, as required. Standard NATO markings and (or) colored lights indicate the route into a new position. This matrix frees the commander to reconnoiter other positions and easily can be adapted for semiautonomous sections.

Movement Matrix

Recon	11	12	13					
Prepare	11	12						
Occupy	11							

Platoon-Level Training

In contradiction to the guidance in *FM 6-50 Field Artillery Cannon Battery*, we use the commander to reconnoiter and the gunnery sergeant to complete the reconnaissance and prepare the

position. We put the procedures in a platoon drill, following a standard matrix of reconnaissance, prepare and occupy, which allows the procedures to take place with a minimum of communications or guidance. The procedures also prevent placing the

majority of our key leaders forward of the platoon—a potentially disastrous situation.

In addition, it's doubtful the commander would have the time to completely extend survey or lay out each platoon position in a rapidly moving

Stand To will occur one hour before sunrise. The purpose is to ensure the unit's alertness and readiness at dawn.

Crew Level

- 1. Wake up personnel.
- 2. Check weapons systems (i.e. headspace and timing of .50 caliber, etc.).
- 3. Perform prefire checks.
- 4. Perform combat PMCS and start vehicles.
- 5. Account for personnel and sensitive items and forward reports to platoon operations center.
- 6. Accomplish personal hygiene.
- 7. Change clothing, especially undergarments.
- 8. Roll and secure bedding; fold and secure cots.

Platoon Level

- 1. Check all observation and listening posts and defensive positions.
- 2. Verify lay.
- 3. Dispatch patrols, as required.
- 4. Check wire communications.
- 5. Visit crew sections.
- 6. Forward reports, as required.
- 7. Check on logistical support (chow).

Platoon "Stand To" Drill

scenario; therefore, the burden falls on the gunnery sergeant. He must be a master at his job. He must develop a platoon position that is tactically sound, defensible and facilitates the delivery of fires. He must be the survey specialist, knowing not only the simple mechanics of extending or establishing survey control, but also using this data in the firing computations and knowing their effects on the accurate delivery of fires.

One of his critical tasks is to establish an accurate orienting station location, regardless of the availability of survey for the platoon position. Without this location, the platoon can't accurately mass fires, especially with widely dispersed weapons.

Field Artillery Masters

Once a platoon has occupied a position, the platoon leader, platoon sergeant and gunnery sergeant must form a leadership triad. They must divide the



Assigning supplemental positions should be standard, and occupying them should be incorporated into a battle drill.

duties and responsibilities and establish a series of internal checks to ensure the platoon can perform its combat mission. These leaders must have the skills of infantrymen in defense and early warning; those of tankers in movement, battle drills and armor-defensive positions; and, finally, those of a first sergeant in personnel and logistical management. The triad must be the platoon's "Field Artillery Masters."

Training and developing leaders of this caliber will not be an "overnight sensation." They must train in all types of non-artillery tasks, understand the Threat (tactics, equipment, capabilities and limitations), be expert navigators and, above all, be bold and innovative in training, planning and tactics. In addition, these leaders must develop their "leaders of tomorrow" by creating battle drills, sand-table exercises, chalk talks and terrain walks for, and requiring reading and self study of, their soldiers.

Training for section leaders must include infantry tactics beyond the bounding overwatch usually associated with the reaction force. These NCOs must be able to direct their sections as small fighting units to protect and defend their areas and equipment. They must be patrol leaders because on a future battlefield, the platoon leadership may be too critical in other areas to be actively involved in reconnaissance or even combat patrols.

The leaders at the platoon level must be the Master Trainers for the section NCOs. They must develop these NCOs by involving them in platoon leadership activities during field training exercises

(FTXs), situational training exercises (STXs) and planning and training sessions. Unit NCO professional development sessions should address "real world" survival and combat subjects, as opposed to administrative subjects. All leaders must practice non-standard problem solving, take the initiative, accept and learn from mistakes and then "drive on."

The Field Artillery NCO and officer education systems should consider adding and revising subjects to address these skills. The curricula should expose students to the future developments in the Field Artillery and the responsibilities they could have as leaders at the battery or platoon levels.

The key to successfully implementing the 3x8 concept, the stepping stone to the future, is to develop to the maximum our officers and NCOs to be able to use these technically superior systems coming and ensure unit survival. We must meet and overcome all challenges we face. With foresight, innovative training, teamwork and discipline, we'll be technically and tactically proficient to meet the challenges

of things to come.



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Marine Corps Split-Battery Operations

by Captain D. L. Kearns, USMC, and Captain J. D. Riegel, USMC

During the past five years, Marine Corps Artillery has adjusted and revised its employment techniques with the adoption of the 3x8 concept. This article presents the techniques used in our 3x8 split-battery operations. Marine artillery battery techniques differ slightly throughout the Corps; however, this gives an overview of how we employ 3x8 in the Marine Corps Artillery.

Battery Organization

Marine direct-support (DS) artillery battalions are organized into four batteries: a headquarters battery and three firing batteries. The headquarters battery maintains all the operations and maintenance personnel required to support the battalion. The firing batteries have headquarters, communications, maintenance, liaison and ammunition sections and two firing platoons.

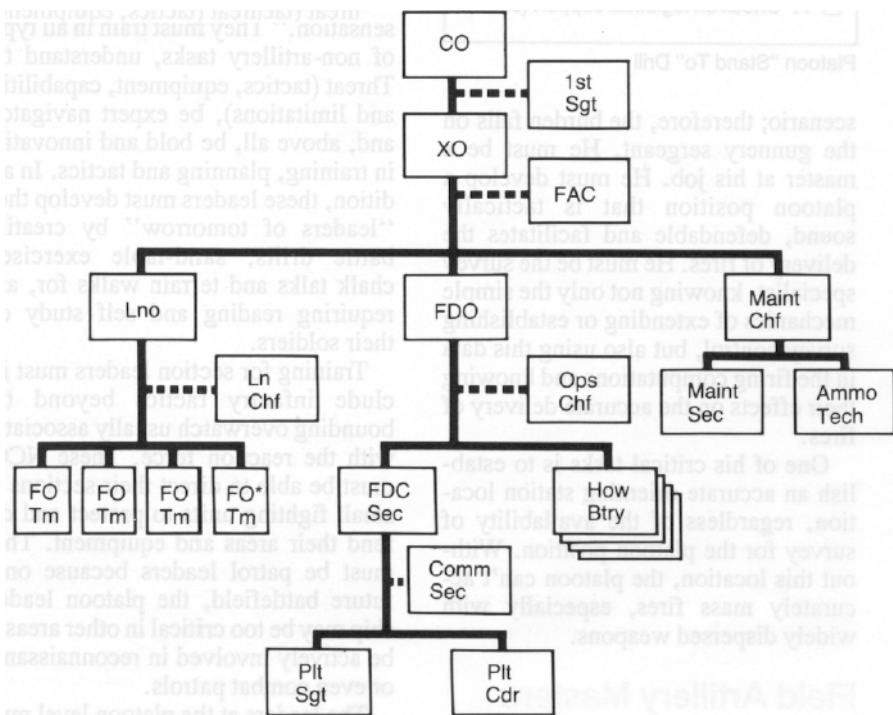
Most firing batteries in DS artillery battalions have the M198 howitzer. A few batteries still maintain the M114A2 howitzer and each artillery regiment has M101A1 howitzers assigned to it for special contingency operations. Batteries organized to deploy with Marine expeditionary units, special operations capable (MEU SOC), convert into a composite battery of four M198 and four M101A1 howitzers about six months before deploying.

This composite structure has unique possibilities for split-battery operations. The M101A1 platoon has the primary

mission of ship-to-shore movement by helicopter to provide artillery support as early in the amphibious operation as possible. The platoon has a secondary mission of conducting artillery raids as part of the MEU (SOC) contingent. The M198 platoon has a primary mission of direct support to the battalion landing team (BLT), the ground combat element of the MEU.

Responsibilities of Key Battery Players

After converting to 3x8, the revised battery organization and mission changed the duties of key players and authorized strengths. In a DS artillery battalion, the battery's authorized strength in officers rose from eight to



**Most firing batteries won't have the fourth FO team until the infantry battalions they habitually support field their fourth infantry company.*

USMC Firing Battery of a DS Artillery Battalion

11 and staff NCOs from six to 10. The process evolved into standard procedures for Marine Corps 3x8 battery operations.

Battery Commander

The Battery Commander's primary responsibility is to ensure the split battery can provide continuous fire support. More than in 3x6 operations, he must stay abreast of the tactical situation by actively seeking information from the artillery battalion commander or operations officer. If the battery is operating autonomously as part of a BLT, he gets information on the tactical situation from the maneuver commander or his operations officer. Once the battery commander understands the situation, he recommends ways to provide the best fire support for the operation.

If the battery is operating as part of an artillery battalion, the battalion commander assigns areas in which the battery commander reconnoiters battery or platoon firing positions. After locating firing positions, the battery commander then briefs his executive officer (XO), platoon commanders, platoon sergeants, first sergeant and Field Artillery chief (FAC) on the new positions and ensures the battalion commander or operations officer has the positions' grid coordinates.

Executive Officer

The XO helps the battery commander in all areas concerning the operation of the battery. Even more critical than in 3x6 operations, the XO must be able to assume the commander's responsibilities in his absence. In fast-paced 3x8 operations or when the battery is deployed with a MEU (SOC), the battery commander may use his XO to reconnoiter a position for one of the firing platoons when movement is critical and time is limited. Also, the XO is responsible for the logistical and maintenance support for the eight-gun battery and acts as the liaison with battalion and other external support agencies, when authorized.

Field Artillery Chief

The FAC is the senior enlisted artilleryman in the battery. He's the primary

assistant to the battery commander on all matters pertaining to gun-line operations. He's also the battery local security chief, responsible for training the platoon security chiefs and integrating platoon security into the battery local security plan.

First Sergeant

The first sergeant is the primary advisor to the battery commander on all matters pertaining to enlisted Marines and administration of the battery. He also helps the XO provide logistical and maintenance support for the battery.

Platoon Commander

The platoon commander is responsible for tactically employing his platoon to support the maneuver units at all times. During MEU (SOC) operations, he may have to operate with his platoon independently, as the battery commander may be advising the BLT commander on and planning for the employment of fire support assets.

Platoon Sergeant

The platoon sergeant is the primary assistant to the platoon commander in all matters pertaining to gun-line procedures. He's responsible for advance party operations, to include securing and preparing the new platoon position.

He also prepares the platoon local security plan and diagram.

Tactical Operations

The 3x8 concept gives the artillery battalion commander additional flexibility in providing continuous fire support. Since the preferred method of attacking targets is to mass the battalion fires, two basic considerations in employing the artillery battery have remained constant under this concept: the battery is the smallest firing unit considered when attacking targets, and when scheduling fires, the battery is the firing unit. These considerations mean Marine artillerymen view split-battery operations as an employment option used to survive on a battlefield that has a high counterbattery threat, *not* as a standard means of employment. This flexibility allows Marines to deploy around the world and face enemies of varying counterbattery capabilities. In tactical operations where the counterbattery threat isn't significant, split-battery operations may not be the best employment option to ensure survival or most effectively mass fires.

Reconnoitering Procedures

Since the primary purpose of split-battery operations is to improve survivability,



The M198 platoon of A Battery, 1st Battalion, 10th Marines, at Camp Lejeune firing in split-battery operations.



Battery A coming ashore in Egypt in support of the 24th MEU (SOC) for Operation Bright Star 87.



Battery A's M101A1 platoon trains for split-battery operations at Camp Lejeune to support MEU (SOC).

platoons are separated from 400 to 1500 meters. With the exception of reconnoitering procedures, the separation hasn't changed the way Marine batteries move and occupy positions. The battery commander reconnoiters the platoon position, and the platoon sergeant secures and prepares the platoon's new position during advance-party operations. The platoon commander remains with his platoon and moves his unit between positions.

FDC Procedures


The distance between platoons obviously makes attacking targets as a battery a more involved process. Marine artillery batteries simplify this process by assigning one of the firing platoon's fire direction centers (FDCs) as the control FDC and the other as the alternate FDC.

The control FDC handles all communications for the battery while the

alternate FDC monitors the communications. As all forward observers (FOs) are located at the firing battery level, all calls for fire are sent to the battery over the conduct-of-fire net and processed by the control FDC. The fire direction officer (FDO) of the control FDC issues the fire order, ensuring it's sent to the alternate FDC. The control FDC always maintains tactical control of the battery; however depending on the situation, the control FDC may or may not compute firing data for the alternate FDC.

The artillery battalion's FDC monitors the conduct-of-fire nets for all batteries. If the battalion FDO determines a target is too large for one battery or the battery's controlling FDO requests reinforcing fires, the battalion FDO assumes tactical control of the fire mission to mass the battalion.

Summary

Employing split-battery operations as one option gives Marine Corps artillery the flexibility it needs to provide continuous fires in all situations. It also gives the MEU (SOC) the best capabilities of both medium and light artillery. The Marine Corps has fully adopted the 3x8 concept, and its employment is limited only by one's imagination. 

Captain D. L. Kearns, USMC, is an instructor in the Basic Fire Support Branch of the Fire Support and Combined Arms Operations Department, Field Artillery School, Fort Sill, Oklahoma. Captain Kearns has had more than two and one-half years of battery command. He commanded Headquarters and A Batteries, 1st Battalion, 10th Marines, Camp Lejeune, North Carolina, the latter he deployed with as part of a Battalion Landing Team (BLT) with the 24th Marine Expeditionary Unit (Special Operations Capable) to the Mediterranean and Indian Oceans. He also commanded the Ammunition Company, 2d Supply Battalion, 2d Force Service Support Group, Camp Lejeune.

Captain J. D. Reigel, USMC, has been an instructor in the Basic Fire Support Branch of the Field Artillery School for more than a year. He has served as a platoon leader, fire direction officer and forward observer for A Battery, 1st Battalion, 10th Marines, Camp Lejeune. While serving as Executive Officer for A Battery, Captain Reigel deployed as part of a BLT with the 24th Marine Expeditionary Unit (Special Operations Capable) to the Mediterranean Ocean.

Restructured Survey and the 3x8 Battalion

by Captain Paul Lacusky and D. J. Branham

Do you remember when the battalion survey parties habitually were late surveying your battery firing position? As the guns were getting ready to march order, a survey party using a theodolite and a steel tape were just arriving. Thanks to advances in technology, battalion surveyors now can keep up with the many moves today's artillery must make.

These technological gains have resulted in new or improved equipment that has reduced our manning requirements. Because of these and doctrinal changes, we're restructuring Field Artillery survey sections.

The standard survey section consists of integrated teams of position and azimuth determining system (PADS) and conventional surveyors. A survey section that was personnel-intensive will be a dependable, equipment-intensive section with the restructure. The Field Artillery of the 1990s will be far different from today's.

Exercises at the National Training Center, Fort Irwin, California, have shown that conventional ways of surveying can't keep up with AirLand Battle operations. This article explains how the new structure will improve survey responsiveness and flexibility by integrating conventional and automated survey. To say, "Go survey the batteries here and here" is not enough. To have common grid and direction for six firing elements and attachments,

you'll have to set priorities, plan and integrate all your survey assets.

To accomplish the survey mission in the 3x8 battalion, surveyors must use all available technology efficiently. Since the 3x8 battalion deploys two firing platoons per battery, it needs twice as many surveyed positions as a 3x6 battalion does. Using the survey section properly is a "must" in AirLand Battle. All of the survey planners must use the PADS teams and the survey team as a single entity. Their combined efforts must accomplish the total mission in the minimum time.

New Structure

The survey platoon in a 3x8 Field Artillery battalion is assigned to the headquarters battery. Its mission is to provide survey support to each firing platoon of each gun battery and to target acquisition (TA) assets, such as an attached Firefinder radar section. Figure 1 shows the duty positions and the organization of the survey platoon.

Survey Platoon Headquarters

The survey platoon headquarters is the command and control element of the battalion's survey assets. The reconnaissance and survey officer (a first lieutenant) and the chief surveyor (a sergeant first class) plan and coordinate survey. Also authorized is a Field Artillery surveyor (specialist) who performs

survey tasks when required and is the driver and radio-telephone operator.

Survey Section

The survey section has a staff sergeant as the section chief, one survey team and two PADS teams.

Survey Team. The survey team consists of a specialist and a private first class. They use conventional and modified survey methods, as directed by the section chief to enhance the overall survey effort.

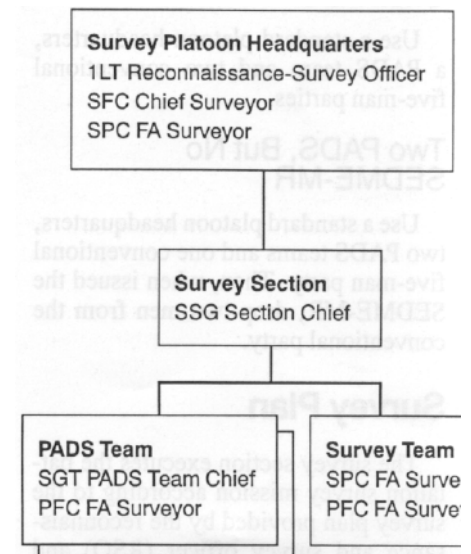


Figure 1: Survey Platoon Personnel and Organization

Two PADS Teams. Each PADS team consists of a sergeant (team chief) and a private first class. The two PADS teams provide survey control to the supported unit, as directed by the section chief.

Equipment Constraints

Figure 2 lists the major survey equipment, radios and vehicles for a survey platoon headquarters, a PADS team and a survey team. The structure and organization previously discussed depends heavily on two pieces of equipment: PADS and the survey electronic distance measuring equipment—medium range (SEDME-MR). Until these items are fully fielded, using a five-man survey party (see Figure 3) is an interim solution. A survey section for a 3x8 battalion constrained by equipment shortages has several options.

Equipment	Pit HQ	PADS Team	Survey Team
Binoculars	1	1	1
BUCS General	0	1	2
Communications Security Equipment, TSEC/KY-57	1	1	2
Compass, M2	1	1	1
Survey Set, Arty Fire Control, 4th Order	0	0	1
M203 Grenade Launcher	1	1	1
Laser Rangefinder AN/GVS-5	0	1	1
M60 Machinegun	0	0	1
PADS AN/USQ-70	0	1	0
Radio AN/VRC-46	0	1	1
Radio AN/VRC-47	1	0	0
Radio AN/GRC-160	0	0	1
Survey Set, Supplementary (PADS)	0	1	0
SEDME-MR with 2 Tripods and 2 Tribachs*	1	0	1
SIAGL	0	0	1
T16 Theodolite with Tripod	0	1	1
Vehicle (HMMWV) with Winch	1	1	1
Vehicle (HMMWV) without Winch	0	0	1

* The SEDME-MR doesn't have the tripods or tribachs you need to operate the equipment.

Figure 2: Major Survey Equipment, Radios and Vehicles for Survey Elements

Interim Five-Man Conventional Survey Party	
SSG	Section Chief
SGT	Survey Computer
SPC	FA Surveyor (Two)
PFC	FA Surveyor

Figure 3: Until the PADS and SEDME-MR are fielded, units use this survey party organization.

No PADS

Use a standard platoon headquarters and three conventional five-man survey parties.

One PADS

Use a standard platoon headquarters, a PADS team and two conventional five-man parties.

Two PADS, But No SEDME-MR

Use a standard platoon headquarters, two PADS teams and one conventional five-man party. Then, when issued the SEDME-MR, drop two men from the conventional party.

Survey Plan

The survey section executes the battalion survey mission according to the survey plan provided by the reconnaissance and survey officer (RSO) and chief surveyor. They must be knowledgeable about the enemy situation and the units planned tactical moves, getting

their information from the S2 and S3. They also must coordinate with the element (SPCE) at division artillery (or

Field Artillery brigade) for the location of survey control points (SCPs) and for help in providing survey control. To devise the survey plan, the RSO

Survey Planning and Coordination Element

At each corps artillery, division artillery and Field Artillery brigade headquarters, there's a command and control cell called the survey planning and coordination element (SPCE). The SPCE plans and coordinates the surveys within its area of responsibility. Also, the SPCE collects, maintains, evaluates and

disseminates survey information.

The division artillery SPCE provides information to all units in its division, adjacent divisions and the corps artillery SPCE. It maintains 24-hour-a-day operations and usually is located near the tactical operations center for easy coordination and communications.

HQ	Rank	Duty Position
Corps Arty	MAJ	Corps Survey Planning and Coordination Officer
	SFC	Chief Surveyor
	SGT	Survey Computers (Three)
Div Arty	CPT	Survey Officer
	SFC	Chief Surveyor
	SGT	Survey Computer
	SPC	FA Surveyors (Two)
FA Bde	SSG	Chief Surveyor
	SGT	Survey Computer
	SPC	FA Surveyors (Two)

The SPCE Organization

and chief surveyor must decide how best to use the PADS teams and the survey team. The priorities and guidance given by the commander or fire support coordinator (FSCOORD) are crucial to their decision. For example during the offensive movement to contact, the battery that will handle all suppression and counterfire missions might have a PADS team during movement to ensure it has accurate and timely survey control. After determining the priority of survey, the two also decide if they need to use modified methods.

The survey plan initially defines which operations the PADS team(s) and the survey team perform. However, the plan must be flexible enough to adapt to sudden changes.

Survey Team

The survey team can support the PADS teams in many ways. In several of those ways, the survey team can add flexibility to the survey section.

Recover Update Points

The PADS team still must close all missions by updating the system over an SCP common to its initial update point before going past the 55-kilometer operating radius and seven-hour mission time. By recovering (locating) final update points, these distance and time barriers are effectively overcome. Instead of wasting time returning to the initial update point, the PADS team can continue to extend control. Not having to return to the initial update point enhances PADS' mission time and accuracy. A coordinated effort to recover survey control as the unit moves to new areas will ensure responsive survey support.

Establish Update Points

If PADS can't occupy a survey control point, the survey team can establish one that's accessible. Although the two-man PADS team could do this task, the PADS would sit idle while the point is surveyed. Remember, the total mission time and the distance traveled since the initial update degrades PADS' accuracy *only* if you go beyond PADS' time and distance limitations.

Provide Fast Common Direction

Azimuth is the most critical element for firing units and TA assets. The survey

team can establish direction quickly whenever the PADS teams are involved with other missions. It can place installations on a common azimuth immediately, using simultaneous observation (simo) or modified astronomic observation (mastros). (See *Special Text 6-2-20 AirLand Battle Survey Operations* for modified survey methods.)

Establish Alternate Positions

The survey team can establish alternate and (or) offset positions for firing units and TA assets.

Operate Continuously

By ensuring both the PADS and survey teams are cross-trained, the survey section can operate continuously for 24 hours a day in some situations.

Reconnoiter

The survey team can help the RSO reconnoiter for the battalion. Locating and identifying alternate positions, reporting road and bridge conditions and recovering SCPs are some of the functions that speed up the delivery of survey control. This is currently the responsibility of the RSO.

Conventional Survey

Conventional survey methods provide flexibility for difficult terrain and limited or inaccessible survey control. The survey team shares the workload with the PADS teams. For example, the survey team can provide a master "simo" station for units moving into unsurveyed positions or provide initialization or update points for the PADS in areas where survey control is inaccessible to PADS.

Master Simo Station

After entering an unsurveyed area, the survey team selects a central location in the area of operations and establishes the master station. If no survey control is available, the team determines the mapspot and performs an astronomic observation for direction. If survey control is available and usable, it uses it. As units move into a new position, they contact the survey team and request an azimuth for establishing an orienting line. This keeps the unit on common direction until the PADS team arrives at its location.



Soldiers secure a PADS in a rear-side cargo compartment of a "Huey" helicopter.

Starting Control for PADS

If the PADS teams can't occupy existing starting control because of difficult terrain, then they use conventional survey methods—traverse, triangulation or three-point resection—to provide starting control for PADS.

Update Points for PADS

In areas of limited control, it's advantageous to provide update points for the PADS teams. The survey section chief with the survey team can perform a closed traverse to establish update points along the routes of the PADS teams. They plan the traverse in such a way that the team uses fewer traverse legs.

The team can measure distances quickly with the SEDME. It allows the survey team to establish an update point quickly and accurately (see Figure 4). An update point, such as SCP 1, will provide more accurate PADS adjusted data and save valuable time.

Azimuth for Locations

The survey team can provide azimuth to installations quickly by performing an astronomic observation; a short, closed directional traverse; a three-point resection; or by using the survey instrument, azimuth gyro-lightweight (SIAGL).



The SEDME-MR measures survey distances up to 7,000 meters.

SP4 L. Sizemore

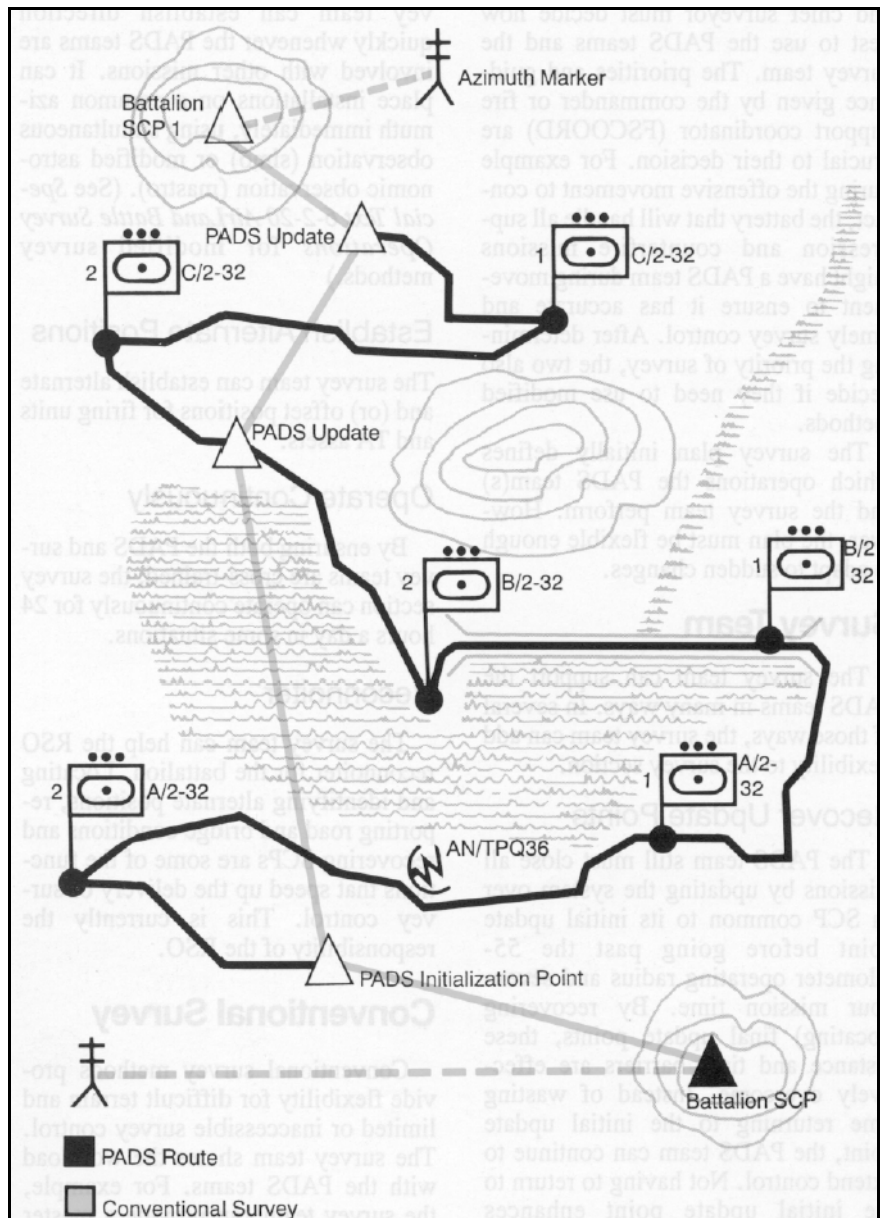


Figure 4: Update Points for PADS

Control for Locations

To help the PADS teams with the workload, the survey team can extend survey control to a firing unit and other locations.

Survey Control Extended from Existing Control. In Figure 5, the survey team provides survey control to one firing battery and the radar. The traverse scheme includes a PADS update point. This update point (tie-in SCP) lets the PADS team update and provide adjusted survey data more quickly than by returning to the battalion SCP from the observation post or mortar platoon.

Alternate Positions. While the

PADS teams provide survey control to the primary positions and TA assets, the survey team uses short traverses to provide control to alternate positions. These traverses should start from the PADS points and close on the starting point (see Figure 6).

If conventional survey starts from a PADS point, it should close on the same starting point. The team computes closing data using the standard closure computations. Closing on the starting point checks the field work.

It sometimes may be impractical to close on the starting point. The team can close on a second PADS point, but closing computations must take into account the 0.4-mil probable error (PE)

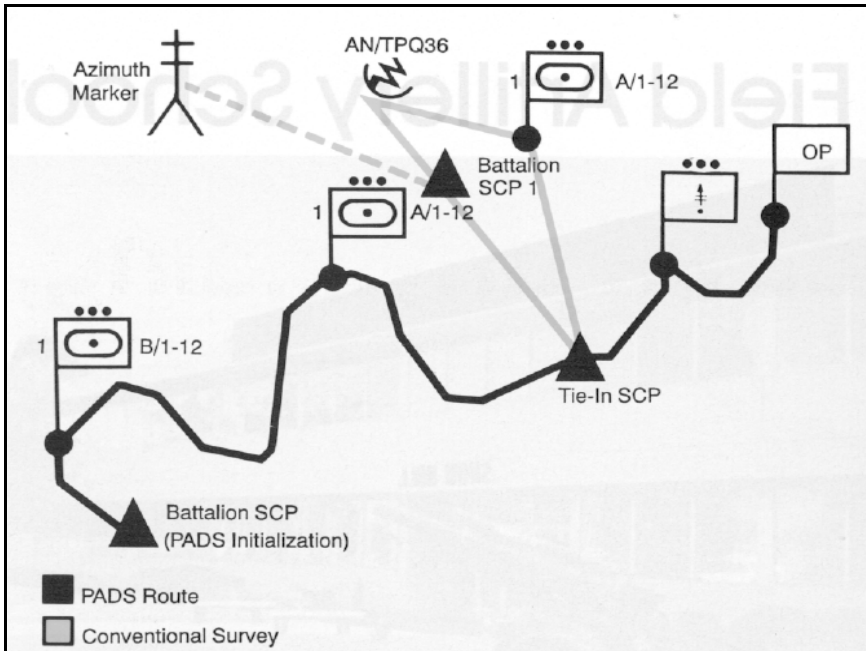


Figure 5: Survey control can be extended from the existing control. The survey team provides survey control to one firing battery and the radar.

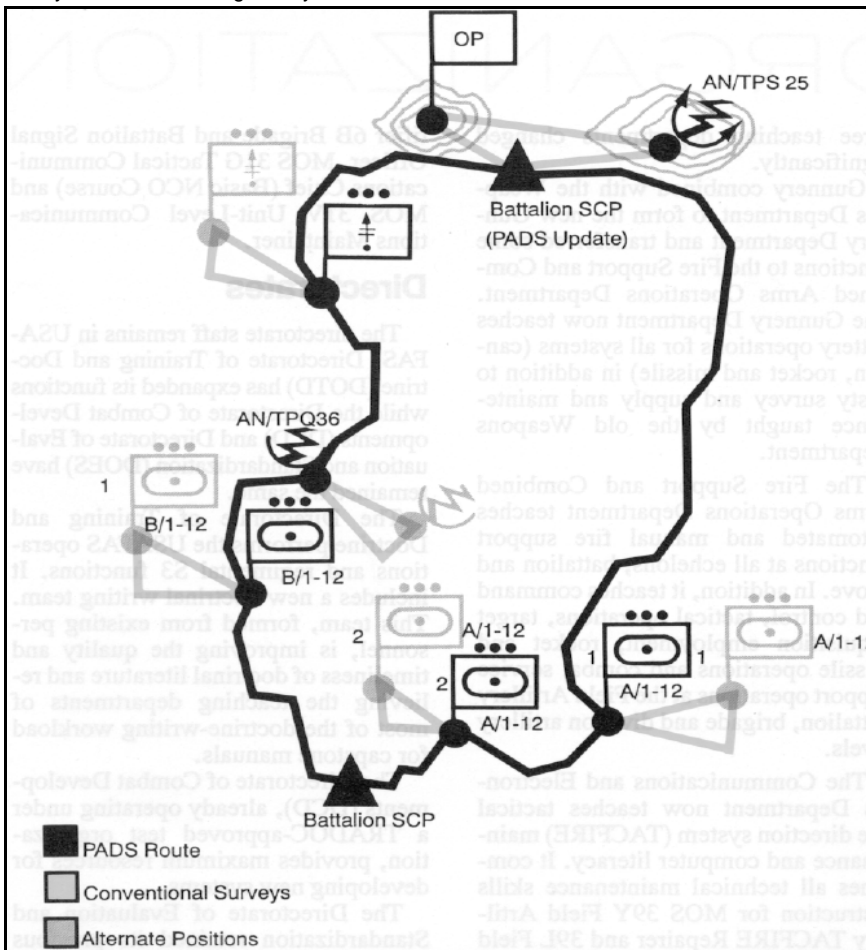
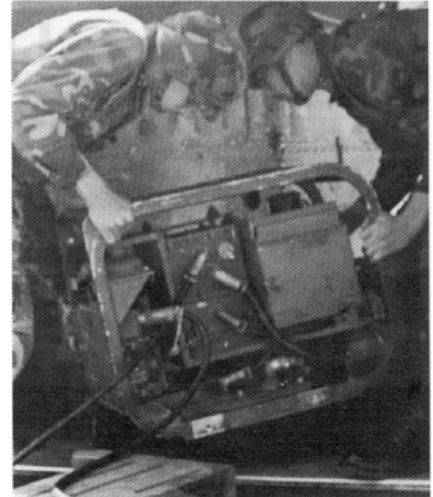


Figure 6: Survey control can be extended to alternate positions and those not accessible to PADS. The survey team uses short traverses to provide control to alternate positions, starting from the PADS point and closing on the starting point.



Soldiers can use PADS in several types of trucks and OH58D and UH1 helicopters, the latter shown here.

in azimuth and the horizontal position circular error probable (CEP) of the starting and closing points.

Conclusion

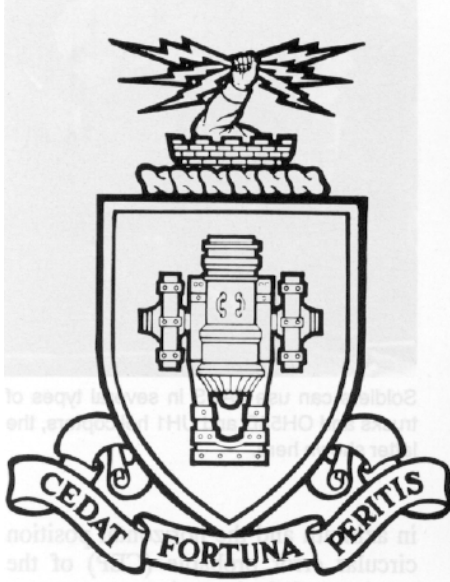
Our traditional ways of surveying can't keep up with the 100 percent increase in requirements for surveyed positions for our 3x8 battalions. But by fielding our new equipment and restructuring our survey sections, Field Artillery will be ready to meet the mobility challenges of the 1990s.



Captain (P) Paul Lacusky is Chief of the Survey Division, Target Acquisition Department (TAD), Field Artillery School, Fort Sill, Oklahoma. He also served as a project officer in the New Systems Division of TAD. Captain Lacusky commanded Service Battery, 3d Battalion, 21st Field Artillery, and K Battery, 29th Field Artillery (TA), both in the 5th Infantry Division (Mechanized), Fort Polk, Louisiana.

D. J. Branham is a Training Specialist in the Training and Doctrine Development Team of the Survey Division, TAD. During his 12 years in the Army, he worked in survey section positions in Germany, Korea and Fort Sill. Mr. Branham also served two tours as an instructor for the Survey Course and Marine Corps Fire Controlman Course at the Field Artillery School. He graduated with honors in Business Administration from Cameron University, Lawton, Oklahoma.

The US Field Artillery School



REORGANIZATION

The Commanding General of the US Army Training and Doctrine Command (TRADOC) approved the reorganization of the US Army Field Artillery School (USAFAS), effective during FY 89. The new structure combines some organizations and reduces the size of others. It prepares USAFAS to adapt to future manpower constraints and new system fielding requirements with minimal turbulence and disruption of mission performance. It also provisionally regimentalizes USAFAS, pending Department of the Army approval, and introduces small group instruction (SGI) into the Officer Advanced Course (OAC).

Teaching Departments

Several major changes occurred in USAFAS to align teaching functions with the battlefield and eliminate split proponenty for certain functions and military occupational specialties (MOSs). Four teaching departments remain in USAFAS: Target Acquisition Department (TAD), Gunnery Department (GD), Fire Support and Combined Arms Operations Department (FSCAOD) and the Communications and Electronics Department (CED). Though the Target Acquisition Department remained the same, the other three teaching departments

changed significantly.

Gunnery combined with the Weapons Department to form the new Gunnery Department and transferred some functions to the Fire Support and Combined Arms Operations Department. The Gunnery Department now teaches battery operations for all systems (cannon, rocket and missile) in addition to hasty survey and supply and maintenance taught by the old Weapons Department.

The Fire Support and Combined Arms Operations Department teaches automated and manual fire support functions at all echelons, battalion and above. In addition, it teaches command and control, tactical operations, target acquisition employment, rocket and missile operations and combat service support operations at the Field Artillery battalion, brigade and division artillery levels.

The Communications and Electronics Department now teaches tactical fire direction system (TACFIRE) maintenance and computer literacy. It combines all technical maintenance skills instruction for MOS 39Y Field Artillery TACFIRE Repairer and 39L Field Artillery Digital Systems Repairer in one department. The Department also is the training proponent for Skill Identifier 6B Brigade and Battalion Signal Officer, MOS 31G

Tactical Communications Chief (Basic NCO Course) and MOS 31V Unit-Level Communications Maintainer.

Directorates

The directorate staff remains in USAFAS. Directorate of Training and Doctrine (DOTD) has expanded its functions while the Directorate of Combat Developments (DCD) and Directorate of Evaluation and Standardization (DOES) have remained the same.

The Directorate of Training and Doctrine performs the USAFAS operations and regimental S3 functions. It includes a new doctrinal writing team. This team, formed from existing personnel, is improving the quality and timeliness of doctrinal literature and relieving the teaching departments of most of the doctrine-writing workload for capstone manuals.

The Directorate of Combat Developments (DCD), already operating under a TRADOC-approved test organization, provides maximum resources for developing new systems.

The Directorate of Evaluation and Standardization retained its previous mission to conduct internal and external evaluations, based on internal and unit feedback.

Chief of Staff, USAFAS

The Office of the Secretary assumed the duties of the inactivated School Brigade's S1, S2 and S4 and changed its name to Chief of Staff, USAFAS (C/S, USAFAS). It performs all personnel, Security and logistics functions for USAFAS, as well as for the Regiment, through the Personnel Management Office, Security Office and Office of Logistics, respectively.

Proponency

The Field Artillery Proponency Office reorganized to consolidate USAFAS activities related to branch proponency and advocacy. This includes resolving issues related to Field Artillery systems, doctrine, training and personnel and managing branch public relations promotionals.

School Brigade

The Field Artillery School has created a provisional regimental structure and concurrently inactivated the School Brigade early this month. In the new regimental structure, the Officer Student Battalion divided into two battalions, each as part of two departments in the School. The Gunnery Department contains the 3d Battalion, 30th Field Artillery, which is the unit of assignment for Officer Basic Course students. The Fire Support and Combined Arms Operations Department includes the 5th Battalion, 30th Field Artillery, which provides leadership and command and control for Officer Advanced Course students.

A third battalion, the 1st Battalion, 30th Field Artillery, includes students attending other courses and staff and faculty, except those in the Gunnery and Fire Support and Combined Arms Operations Departments. It also includes the International Student Battery for allied students.

The staff functions performed by the School Brigade transferred to the Chief of Staff, USAFAS, and the Directorate of Training and Doctrine.

The batteries, battalions and departments exercise command and control through the Assistant Commandant, who concurrently serves as Regimental Commander.

Field Artillery Information, Feedback and Services

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☐ ARTEP-SQT-AMTP-NTC-JRTC*

Hotline, call 2064.

☐ Redleg Hotline for other artillery-related subjects, call 4020.

☐ Field Artillery School Micro User's Group (FASMUG) Electronic Bulletin Board encourages the exchange of ideas and programs among personal computer users throughout the military; call 5255. FASMUG runs at 2400 BAUD and is usually operational 23 hours a day. For voice assistance, call 5412.

☐ USAFAS Computer Laboratory provides Fort Sill Public Domain Library and Computer Literacy Training textbooks. Units can send blank 5 1/4-inch disks to USAFAS, Snow Hall Computer Laboratory, Room 6, Fort Sill, OK 73503-5600. For information, call 5814.

*As of 15 March 1989, this hotline will become the "Unit Training Hotline" with a new telephone number: 5004. Units with questions relating to the NTC or JRTC will call the "Redleg Hotline."

Second Lieutenant, Field Artillery



From West Point we get Lieutenants
With bars all shiny new.
We take graduates from OCS
And from ROTC too.

Our mission now is twofold
When they first report to Sill,
Teach them about Artillery,
First the basics, then the skills.

But the thing we cannot teach them
Must come from deep inside.
It's the quality of Leadership,
Which can only come with pride.

Artillerymen at Valley Forge,
And Gettysburg as well,
Helped stem the tide of battle,
Though many of them fell.

You can learn from our instructors
What to do when things go wrong,
For the combat soldiers look to you,
Your decision can't take long.

When leader training is complete,
Alone you fall or stand,
With Saint Barbara's guide
and pride inside,
Assume your first command.

John J. McMahon

*Artillery Horseman, World War II
McCloud, Oklahoma*

US Army Field Artillery School (USAFAS)

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Right by Piece

The Maneuver Commander's Fire Support and Maneuver Course

The "battles" fought at the National Training Center (NTC) in California's Mojave Desert "drive home" the fundamentals of war-fighting. That is, battlefield success depends on synchronizing and focusing combat power. The fire supporter is successful when he synchronizes and executes the commander's intent and scheme of maneuver in his fire support scheme of maneuver. Not a novel idea—nor a simple one.

We don't need to search around for who is responsible for synchronizing fire support with the other six battlefield operating systems—it's the maneuver commander. Therefore, we should train the maneuver commander at home so he can master the "graduate course" at the NTC and win the first battle of the next war.

The company-team commander "owns" both the maneuver and fire support plans. He must execute his portion of the task-force commander's battle scheme. So, in addition to executing specified and implied maneuver tasks, he's responsible for specified and implied fire support tasks.

The maneuver commander sets the stage for failure when he builds his scheme of maneuver and then tells the fire support officer (FSO) to build and execute a fire plan to support it. Instead, the maneuver commander should tell his FSO the role he wants fire support to play at the same time he's planning his scheme. By doing so, he builds a scheme that gets the most out of both maneuver and fire support.

We have learned during combined-arms live-fire exercises (CALFEXs) and at the NTC that the fire support execution matrix works well. It's well-received and adopted by maneuver commanders and is a big step forward in synchronizing fire support with maneuver. The idea is focusing *all available* combat power at key places and times. With the matrix, we do well in planning and coordination but get mixed results in execution. The solution: continue to sharpen fire support skills and educate the maneuver commander on synchronizing combat power. One of the tools we use to do this in the 1st Cavalry Division is the Maneuver Commander's Fire Support and Maneuver Course.

Course Sequence

1. Commander reports to the Course with command vehicle (M1, M2) and complete crew.
2. Commander and FIST receive administrative-safety briefing.
3. Commander and FIST receive task-force order with intelligence and fire support annexes.
4. Commander and FIST reconnoiter and develop a scheme of maneuver and fire support scheme of maneuver.
5. The company-team plan plus supporting fire plans are briefed to controllers and players.
6. Commander negotiates the course *without FIST* while notion-ally moving his company-team via FM radio.
7. After-action reviews address key issues of both maneuver and fire support.

The Maneuver Commander's Fire Support and Maneuver Course requires the company-team commander to fight his company and vehicle and simultaneously ensure fire support is executed in a live-fire exercise.

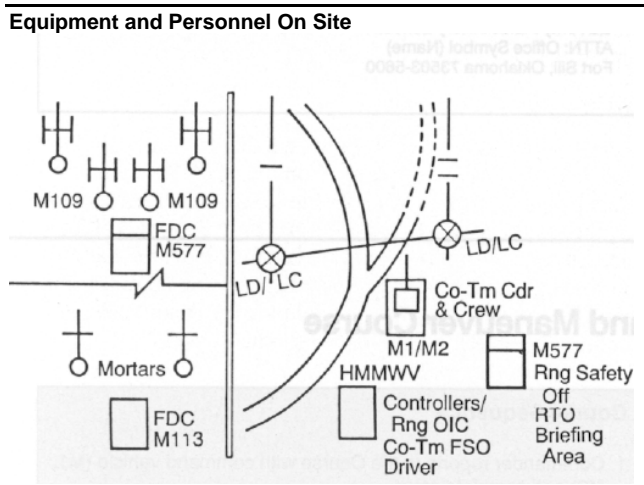
The Course

The Course provides the company-team commander a live-fire exercise that requires him to fight his company, Abrams tank or Bradley fighting vehicle and, simultaneously, ensure fire support is executed—synchronizing combat power at the team level. The Course is a direct and indirect live-fire exercise where all communication nets usually available to the team commander are replicated, complete with tactical radio chatter. Specifically, the commander's vehicle is uploaded with main-gun and machinegun ammunition. He has FM communications with his notional platoon leaders, executive officer, task-force commander, S3 and FSO, and actual communications are available, if necessary, with mortar and artillery personnel.

The commander negotiates the course in his Abrams or Bradley from which he commands and controls his "company," using the FM radio. After planning the operation with his fire support team (FIST), the maneuver commander

is presented a number of situations where he is expected to execute fires from the fire support execution matrix, engage targets with his direct-fire weapons systems, control his platoons and initiate, as necessary, calls for indirect fires.

Controllers who have a detailed understanding of both the task-force commander's intent and team-commander's concept control the Course. They follow the team commander



Layout of the Maneuver Commander's Fire Support and Maneuver Course—Live-Fire Exercise

down the Course and have the fire support execution matrices from both the task force and team. Using a bit of theatrics, controllers provide input for generating Course events, maintain communications between the team commander and notional players and control safety. The Course is realistic, using pyrotechnics portraying enemy indirect and direct fires.

The Results

The Course has been well-received by participants and senior maneuver commanders and has served to make fire support more visible within the Division. Recent fire support successes at the NTC validate the payoff of this type of training.

The Maneuver Commander's Fire Support and Maneuver Course reinforces two key principles. First, fire support is too important to be left solely to Field Artillerymen. Second, when the maneuver commander scores a victory on the battlefield, fire support wins.

Tommy R. Franks
COL, FA
Cdr
1st Cav Div Arty

Alan B. Moon
XO
MAJ, FA
1-82 FA
1st Cav Div

Combined-Arms Situational Training Exercise

The 47th Infantry Division (Minnesota Army National Guard), like many other divisions, has had a shortfall of integrating fire support into maneuver operations. We identified this shortfall in annual training evaluations at all levels of command, from division to company. To correct this deficiency, two years ago the Division developed a long-term training program for fire support personnel, named Viking Fire. Viking Fire successfully developed better trained artillerymen, primarily in the 13F MOS. Viking Fire, however, did not completely close the loop on improving integration of fire support with maneuver and intelligence.

The former 47th Division Artillery Commander, Brigadier General Roger D. Delgehausen, developed the concept of a Combined-Arms Situational Training Exercise (CASTX) to address these training shortfalls and close the readiness gap in the Division's use of fire support assets. The three-day CASTX was to train at one location the targeting triads—G3 or S3, G2 or S2 and fire support element (FSE) or fire support officer (FSO)—along with their commanders at division, brigade and battalion levels from the four-state area (Iowa, Illinois, Wisconsin and Minnesota) comprising the 47th Infantry Division.

CASTX Goals and Intent

The four goals of the exercise were to establish firmly the working relationship of the triad, integrate target-value analysis into all levels of fire planning, integrate fire support and

Subjects Covered in the 47th Division Artillery's Three-Day CASTX

- Fire Support for Maneuver Commanders
- Fire Support Coordination Measures
- Engineers
- Air Defense Artillery Positioning, Use and Division
- Air-space Management Element
- Attack Helicopters
- Battlefield Air Interdiction and Close Air Support
- Joint Air Attack Team
- Legal Aspects of Targeting
- Target Acquisition Resources
- Target Evaluation
- Fire Support Ammunition
- Positioning and Repositioning Considerations
- Combat Electronic Warfare and Intelligence

maneuver at battalion, brigade and division levels and properly implement target attack guidance.

The intent of the CASTX was to bring together the combined-arms team, working in synchronization to achieve maximum effective combat firepower. Also, we reviewed the principles of fire support planning and the capabilities of

other systems, including electronic warfare and engineers, within the context of maneuver planning.

Planning and Coordination

Because of the scope of the exercise and the need to train on current doctrine, we needed support from outside agencies. The US Army Readiness Group, Fort Snelling, Minnesota, was instrumental in getting resources from the Fourth US Army and the Field Artillery School. The project officer and a representative from the Readiness Group visited with the School's Director of the Fire Support and Combined Arms Operations Department and coordinated the topics of instruction and instructors for the exercise. Brigadier General David L. Cole, III Corps Artillery Commander, was the keynote speaker at the exercise.

We selected Camp Dodge, Iowa, as the site for CASTX because of its training facilities and accommodations. One hundred eighty-three students and 60 support personnel and instructors attended the exercise on 8 through 10 April 1988.

Execution

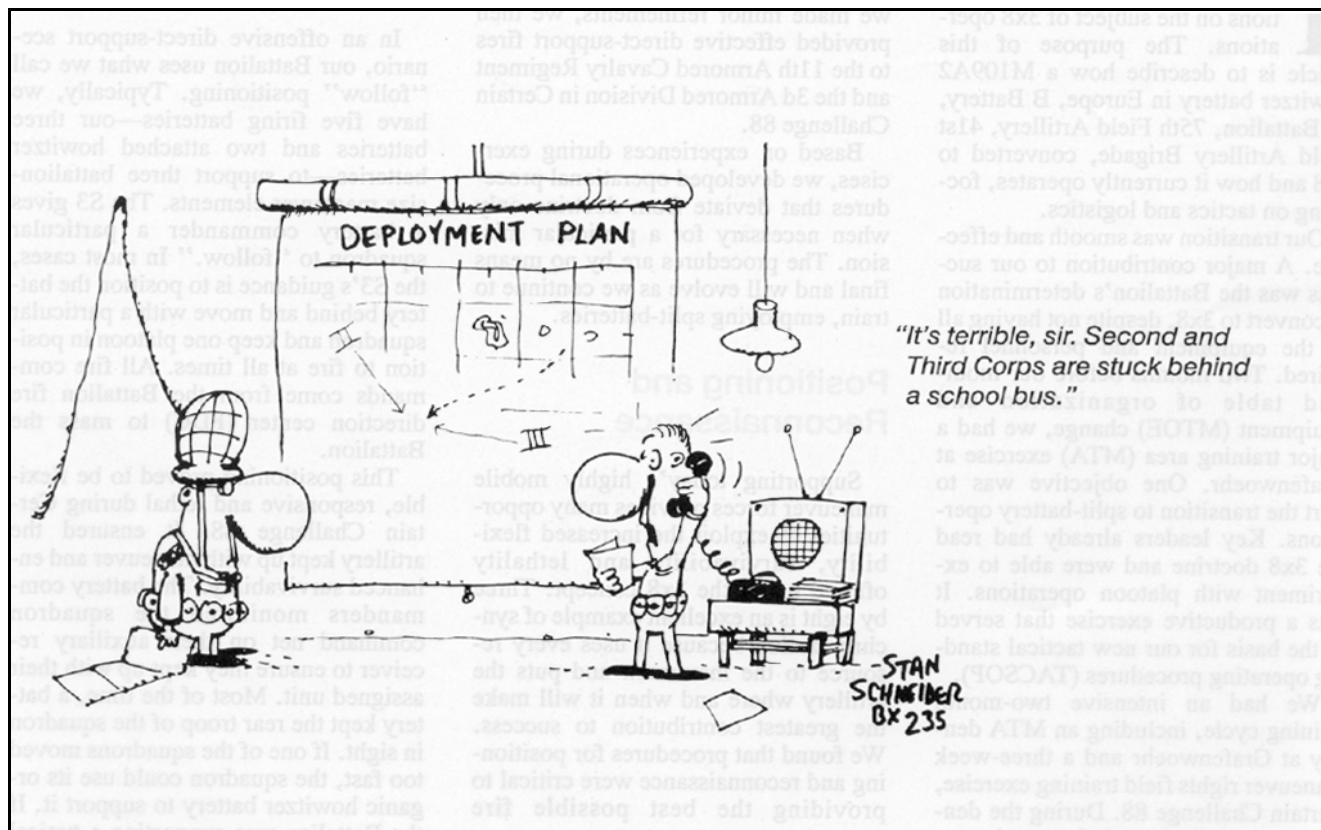
Personnel from throughout the Division attended in an inactive duty training (IDT) or full-time training duty (FTTD) status. The situational training exercise began with platform instruction covering fire support subjects. Then we presented students special situations to exercise their skills, using the Training and Doctrine Command's

common teaching scenario. We broke students into battalion-, brigade- and division-level groups, allowing a free exchange of ideas and problem solving. Students developed and selected courses of action. Operation orders initially were developed at home station for presentation at CASTX, then the operations orders were further developed during the training exercise as students faced special situations. The triad at each echelon developed a high-payoff target list and an attack-guidance matrix. This resulted in the participant's understanding how the target value list impacts on fire planning and how fire support is integrated into the scheme of maneuver.

After-Action Review

After completing the exercise, we distributed evaluation questionnaires to participants. Comments from the participants gave high marks to the entire exercise and, in particular, the instructors from the Field Artillery School. With the success of this training, the 47th Infantry Division had laid the foundation for its Warfighter III exercise (Battle Command Training Program) at annual training in June. We will conduct the CASTX again in the spring of 1991.

Gary A. Lindeman
LTC, FA
AFSCOORD
47th IN Div Arty





3x8 Synchronization on the Battlefield

by Captain William R. Lodwick

There have been several publications on the subject of 3x8 operations. The purpose of this article is to describe how a M109A2 howitzer battery in Europe, B Battery, 2d Battalion, 75th Field Artillery, 41st Field Artillery Brigade, converted to 3x8 and how it currently operates, focusing on tactics and logistics.

Our transition was smooth and effective. A major contribution to our success was the Battalion's determination to convert to 3x8, despite not having all of the equipment and personnel required. Two months before our modified table of organization and equipment (MTOE) change, we had a major training area (MTA) exercise at Grafenwoehr. One objective was to start the transition to split-battery operations. Key leaders already had read the 3x8 doctrine and were able to experiment with platoon operations. It was a productive exercise that served as the basis for our new tactical standing operating procedures (TACSOP).

We had an intensive two-month training cycle, including an MTA density at Grafenwoehr and a three-week maneuver rights field training exercise, Certain Challenge 88. During the density, we validated our 3x8 operations at both

battery and battalion levels. After we made minor refinements, we then provided effective direct-support fires to the 11th Armored Cavalry Regiment and the 3d Armored Division in Certain Challenge 88.

Based on experiences during exercises, we developed operational procedures that deviate from doctrine only when necessary for a particular mission. The procedures are by no means final and will evolve as we continue to train, employing split-batteries.

Positioning and Reconnaissance

Supporting today's highly mobile maneuver forces provides many opportunities to exploit the increased flexibility, survivability and lethality offered under the 3x8 concept. Three by eight is an excellent example of synchronization because it uses every resource to the maximum and puts the artillery where and when it will make the greatest contribution to success. We found that procedures for positioning and reconnaissance were critical to providing the best possible fire support.

"Follow" Positioning

In an offensive direct-support scenario, our Battalion uses what we call "follow" positioning. Typically, we have five firing batteries—our three batteries and two attached howitzer batteries—to support three battalion-size maneuver elements. The S3 gives a battery commander a particular squadron to "follow." In most cases, the S3's guidance is to position the battery behind and move with a particular squadron and keep one platoon in position to fire at all times. All fire commands come from the Battalion fire direction center (FDC) to mass the Battalion.

This positioning proved to be flexible, responsive and lethal during Certain Challenge 88. It ensured the artillery kept up with maneuver and enhanced survivability. The battery commanders monitored the squadron command net on their auxiliary receiver to ensure they kept up with their assigned unit. Most of the time, a battery kept the rear troop of the squadron in sight. If one of the squadrons moved too fast, the squadron could use its organic howitzer battery to support it. If the Battalion was supporting a typical

brigade, which doesn't have organic artillery, the battery following the maneuver battalion could be used as a dedicated battery. Either way, the artillery was at the right place and time to provide the best possible fire support to the maneuver commander.

Defensive Positioning

In a defensive scenario, the firing batteries have sectors or belts in which to maneuver. The battery commander keeps one platoon in position while moving the other. However, the commander doesn't have to keep one platoon in position at all times. The S3 has the option of changing the guidance and moving both platoons at once or keeping them in position.

During Certain Challenge 88, our survivability was enhanced significantly by following maneuver forces. If a battery followed a different route or sector, it was more likely it would encounter enemy forces or bypassed pockets of resistance. The path cleared by maneuver allowed us to move, using a combination of open column and terrain march. We used terrain march only when necessary, based on the enemy situation and obstacles.

The biggest benefactor of our increased survivability is the advance party. Our reconnaissance element lacks the armor and firepower necessary to survive even the smallest engagement. Staying right behind the maneuver forces is the next best thing to being escorted by them.

Occupation

Three by eight has increased the number of positions available for occupation. Many times during the exercise, we had no clear forward line of own troops (FLOT). Particularly during the defense, we had enemy and friendly forces interspersed throughout the battlefield. This greatly increased the platoons' exposure to enemy armor and infantry.

Fortunately, 3x8 and some experimentation came to the rescue. We discovered the enemy had trouble finding platoons occupying clearings in the center of woods or the center of built-up areas. We had many places for our platoons to hide in and shoot from. The positions offered a rapid and well-camouflaged occupation for the artillery and were positions the maneuver forces didn't want because they had extremely limited fields

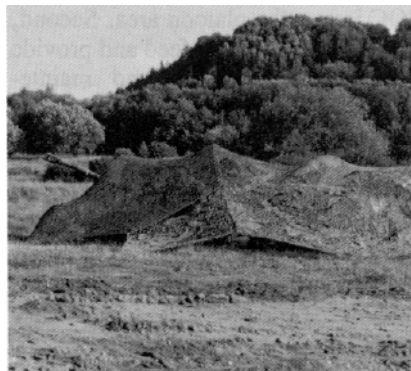
of fire for maneuver direct-fire systems. But they were perfect positions from which to shoot 6400-mil fires, which was a necessity on the fluid battlefield.

Reconnaissance

The firing battery commander reconnoiters the assigned sector and the maneuver route of march. He links up with each gunnery sergeant and his advance party. We found it critical that the senior lieutenant, the platoon leader, stay with his platoon. His leadership was an invaluable asset while firing and moving. The gunnery sergeant, with limited guidance from the battery commander, prepares the next position. The commander then moves on to the other platoon's next position and links up with its gunnery sergeant and advance party. This worked extremely well during Certain Challenge 88, and we continued the procedures with little difficulty throughout the exercise.

A second method of reconnaissance is using the first sergeant as the "Deputy Commander." At times, the platoons are separated by as many as 20 kilometers (in support of a regimental front more than 100 kilometers wide). The commander supervises one platoon while the first sergeant supervises another.

This division of responsibility is very effective. The senior leadership understands that under 3x8, the first sergeant is supposed to be in charge of logistics, but he usually has the most tactical experience in the battery. The commander assigns his most important mission to the first sergeant. In rare instances during Certain Challenge 88, it was a logistics mission, but in most



The battery commander keeps one platoon in position while moving the other, unless the S3 tells him otherwise (41st FA Brigade).

cases, it was to help the commander position and move the two platoons.

Logistics

What frees the first sergeant from logistics is superlative support for the batteries from Battalion. The firing batteries operate with two semiautonomous platoons with an attached maintenance contact team. All other support comes from logistics control points (LCPs), raid sites or recovery teams from Battalion maintenance. The commander keeps the platoons as lean as possible. The system is flexible and efficient, links to our tactics and complements 3x8 beautifully.

Service battery coordinates with the S3 and sets up three raid sites per sector. Each firing battery has a raid site through which a platoon passes while displacing. At that site, the platoon receives every class of supply, except Class I. (We resupply Class I at an LCP.) As a maintenance contact team travels with each platoon, it drops requisitions and picks up and turns in parts.

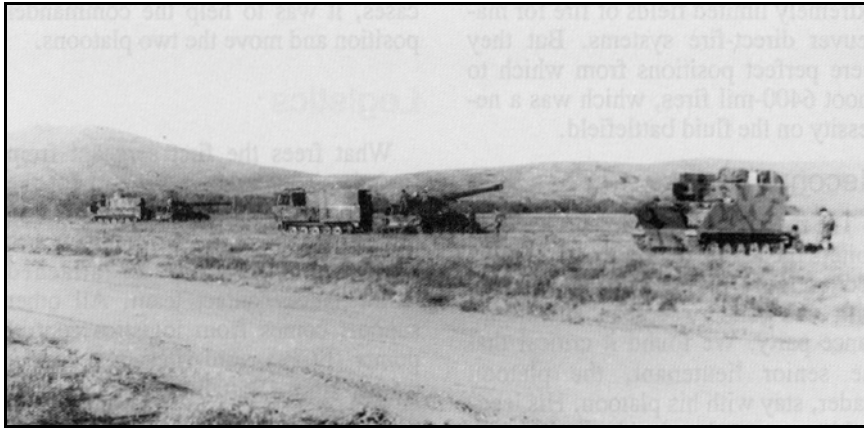
Doctrinally, a raid site is considered major resupply. We use a raid site as a quick-in and -out operation while moving from one firing position to another. This works very well because of the multiple raid sites. We lose little time traveling to and through the raid sites with no congestion, ensuring each platoon is ready to fire as soon as possible.

Conclusion

The 3x8 organization has significantly enhanced the Field Artillery's ability to support maneuver forces and survive on the battlefield. It already has increased our role on future battlefields and lends itself to synchronization at every level.

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Deploying 3x8 Platoons in 8-Inch Batteries

by Captain Thomas D. Taylor

The conversion of M110A2 batteries from four to eight howitzers has brought new challenges for corps artillery self-propelled cannon artillery leaders. The employment of the batteries and battalions has been a concern of those who lead these large units and those who provide tactical guidelines for their employment.

The 3x8 Organization

The 3x8 batteries have two firing platoons and a headquarters platoon. The firing platoons each have four howitzer sections, fire direction and ammunition sections and the firing platoon headquarters. The battery headquarters platoon consists of battery maintenance, supply, food service and communications sections and the battery headquarters. This organization allows the firing platoons to move quickly without having the service support elements slow them down and to cover the distances necessary to survive air and counterbattery attacks. Though this organization is good in theory, few eight-gun batteries operate using the three-platoon concept.

Heavy-Light Platoons

After a year in command of C Battery, 5th Battalion, 18th Field Artillery, I found a modified battery

organization in a field environment is more efficient and would be more effective in combat. Our eight-howitzer M110A2 battery operates using two firing platoons. We attach the service support elements to one firing platoon (heavy platoon) or divide the elements evenly between two firing platoons (light platoons). I, or one of my platoon leaders, modifies these organizations, depending on the battery's mission.

There are advantages to using the two-platoon concept. First, we can manage command and control of the battery more effectively by establishing a battery operations center (BOC) in our first firing platoon. The BOC receives and transmits plans and orders for the battery and the platoon. This alleviates the need for a second operations center in first platoon, unless the BOC leaves the platoon area. Second, we can better supply, feed and provide quick communications and maintenance for the battery when service support elements are in the firing platoons. We save valuable time and expose fewer vehicles to possible enemy air attack when service support vehicles remain under camouflage nets rather than driving from a headquarters platoon on the open road or cross country to support the firing platoons. Third, we can defend service support elements more easily against enemy ground attacks by their being part of a firing platoon's perimeter defense.

Plan, Reconnoiter and Move

Because of a lack of standard guidelines in manuals, many 3x8 battalion and battery commanders have created their own standing operating procedures to meet mission requirements. This article focuses on how C Battery prepares, reconnoiters and moves with two firing platoons.

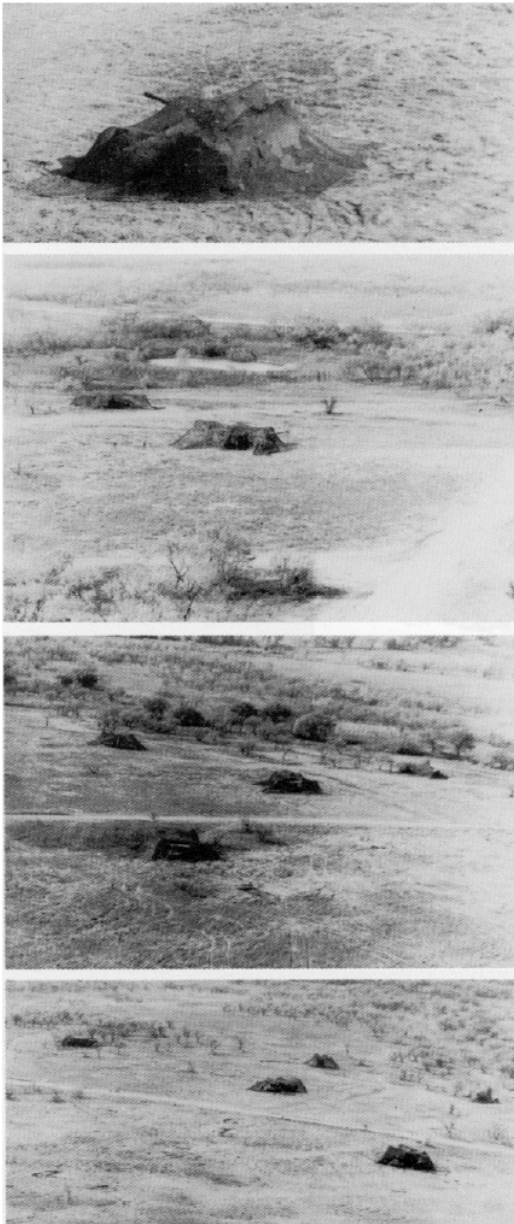
Plan

The reconnaissance, selection and occupation of position (RSOP) begins when the battalion commander or the battalion tactical operations center (TOC) issues a warning order to me or my BOC. The warning order tells me that one or more of our firing platoons will move to a new position; we receive a general grid location, azimuth of fire and a time our platoons should be ready to fire from the new positions. I quickly plan the battery movement and brief the two platoon leaders in person or by FM radio. I tell both the new position area grids, azimuth of fire, time the advance party should leave, route of march and times when the platoons will hit the starting point (SP). Then I reconnoiter the new position areas and routes of march.

Reconnoiter

The advance reconnaissance party (me, my battery first sergeant, two drivers and two reconnaissance vehicles) conducts the reconnaissance along the route of march and in the position areas and selects the best firing positions. We generally choose platoon positions based on mission, enemy, terrain, troops and time available (MET-T) from 500 to 1,500 meters apart, allowing a 100- to 200-meter spread between howitzers and 100 meters between all other vehicles. The first sergeant plans the overall defense of the battery, prepares a rough defense plan for each gunnery sergeant and plans where service support elements will go to best support the firing platoons.

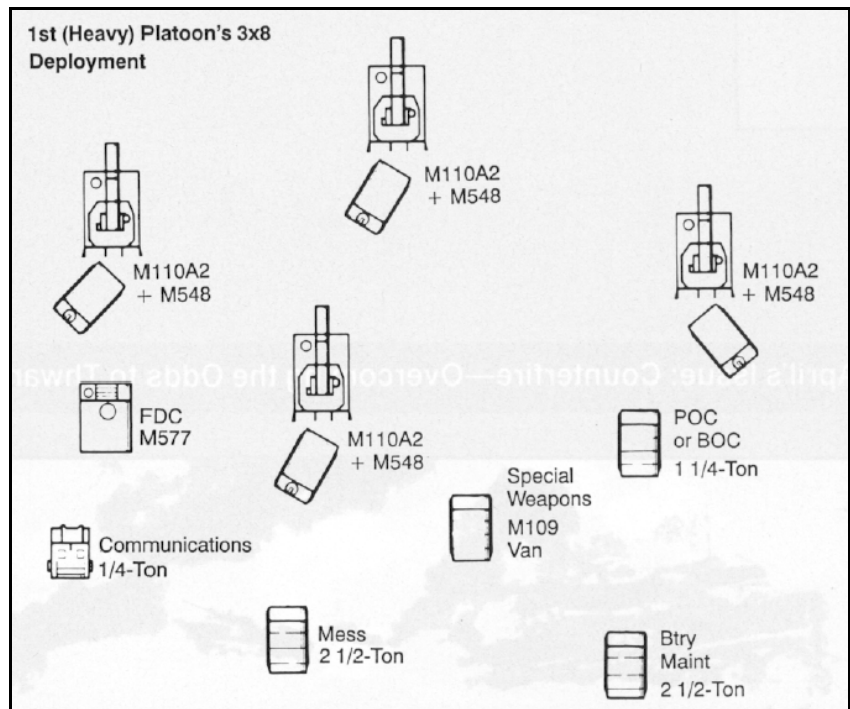
Either before or during the reconnaissance, we coordinate with the battalion survey section to establish a known location and a common direction. The survey section uses its position and azimuth determining system (PADS) to determine the location of the orienting station (ORSTA) and azimuth to the end of the orienting line (EOL) for each platoon. It usually verifies the survey data using an aiming circle to check the azimuth to the EOL by grid



Elements of C Battery, 5-18 FA, in 3x8 position.

azimuth. It verifies the ORSTA by map spot or graphic resection.

The platoon advance party, under the leadership of the gunnery sergeant and the platoon sergeant, arrives in the new firing position to sweep and clear the whole area, prepare the individual howitzer positions, establish platoon wire communication systems, orient aiming circles on the established azimuth of fire, measure and record howitzer lay and displacement data and establish the position track plan from the release point to each howitzer and vehicle position. After the advance



The howitzers are 100 to 200 meters apart with 100 meters between them and all other vehicles, depending on METT-T. The 2d Platoon (light) is the same, minus the mess and special weapons sections. (The supply section may be in either platoon.)


party prepares the position to receive the main body, the gunnery sergeant makes an initial defense plan for his firing platoon, while the rest of the advance party waits for the main body. The fire direction officer directs movement of the firing platoon from his M577 command track.

Move

Our firing platoons move in convoy with howitzer gun sections filing along behind the M577s and the service support elements following the guns. To "police up" and fix any vehicles that have mechanical problems during the move, our maintenance section brings up the rear.

Once the main body arrives and occupies its position, the platoons prepare to fire. The battery and platoon operations centers (POCs) establish communications with the battalion TOC and send platoon data. The fire direction centers compute firing data, and the battery fires in support of the ground-gaining forces. I stay with first platoon in the vicinity of the BOC to receive additional orders or guidance from the battalion and coordinate logistics to support both firing platoons.

Summary

Battery C divided the service support elements between the two firing platoons to better support them and provide a greater chance for the service support elements to survive on the battlefield. The two-platoon, heavy-light organization gives the Battalion flexibility. It's the way we implemented the 3x8 concept to meet the demands of dispersed operations to improve survivability on the battlefield of the future. 

Captain Thomas D. Taylor commands C Battery, 5th Battalion, 18th Field Artillery, III Corps Artillery, Fort Sill, Oklahoma. He has served as the Executive Officer and Battery Fire Direction Officer for A Battery, 6th Battalion, 10th Field Artillery, 72d Field Artillery Brigade, US Army, Europe. He also served as Battalion S2 and Special Weapons Officer for the 6th Battalion, 10th Field Artillery. Captain Taylor received a bachelor's of arts degree in history from The Citadel, Charleston, South Carolina. He's a graduate of the Field Artillery Officer Basic and Advanced Courses, Fort Sill.