

Field Artillery Journal



July-August 1984

A black and white photograph of soldiers in a field. The soldiers are wearing helmets and carrying rifles, standing in a line. They are positioned in front of a large, dark structure, possibly a tent or a piece of military equipment. The background shows bare trees and a clear sky. The overall scene suggests a military operation or a training exercise in a rural or wooded area.

**MAXIN'
TO THE KLAXON**

Field Artillery Journal



THE JOURNAL OF FIRE SUPPORT

Volume 52

July-August 1984

Number 4

ARTICLES

- 16 **One Up on 1a**
by Captain Robert Sankner and Captain Peter H. Norris
- 20 **Dutch Treat**
- 23 **Warring with the Warriors**
by Captain David W. Davis
- 26 **Hunting the Big Game**
by First Lieutenant John A. Bonsell
- 35 **Through the Smoke of Distant Fires**
by Colonel (Retired) Robert M. Stegmaier
- 50 **Common Scents**
by Major Woodrow W. Harrison

FEATURES

- 1 **On the Move**
- 2 **Incoming**
- 29 **View From the Blockhouse**
- 33 **Fragments**
- 33 **Redleg Newsletter**
- 34 **Command Update**
- 42 **Right by Piece**

Cover photo by Sam Orr

The *Field Artillery Journal* (ISSN 0191-975x) is published bimonthly at the US Army Field Artillery School, Fort Sill, OK. Funds for printing are approved by Department of the Army. However, unless otherwise stated, material does not represent official policy or endorsement by any agency of the US Army.

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, P.O. Box 33027, Fort Sill, OK 73503. Telephone numbers are AUTOVON 639-5121/6806 or commercial (405) 355-4677. Dues are \$14.00 per year (\$27.00 for two years and \$40.00 for three years) to US and APO addresses. All other addresses should add \$7.00 for postage.

SUBMISSIONS: All letters and articles should be addressed to Editor, *Field Artillery Journal*, P.O. Box 33311, Fort Sill, OK 73503. Telephone numbers are AUTOVON 639-5121/6806. Material submitted for publication is subject to edit by the *Journal* staff; footnotes and bibliographies may be deleted due to limitation of space.

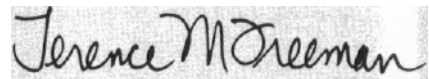
REPRINTS: The *Field Artillery Journal* is pleased to grant permission to reprint articles. Please credit the author and the *Field Artillery Journal*.

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

In the war to end all wars, Black Jack Pershing and his doughboys vowed to fight on until it was "over, over there." When peace came, however, it proved transitory; and the passing years have made "over there" seem to be only next door. And so today, although the rumble of their WWI caissons is no more than a faint echo in history, Redlegs are still supporting the doughboys, but this time with a roar never heard in those days of trenches and 75s. The Pershing II is indicative of how we can turn technological advances into better fire support. In "One Up on 1A" you will meet the system and the special breed of Redlegs who are at the controls. When they are maxin' to the klaxon, the spirit of Black Jack lives on.

The rest of this issue displays other manifestations of our spirited efforts to support today's doughboys. As we take part in field exercises such as Team Spirit '83, we are discovering and correcting deficiencies in our equipment and organization. We are using the concept of a skunkworks to get quick fixes of all kinds to the field. We are developing instructional aids which can train our leaders better at a reduced cost in time and money. And we are turning to the examples of field artillery heroes of the past and present as we adjust our azimuth to the future.

As you read this and future editions of your *Journal*, remember what it really represents. It's one Redleg talking to another Redleg — two individuals on the worldwide stage of fire support who care enough to read or write to make our fire support better. If you want to catch the spirit, look no further — the *Journal* is it.



EDITOR

SECRETARY OF THE ARMY:

Hon. John O. Marsh, Jr.

FIELD ARTILLERY SCHOOL

Commandant:

MG John S. Crosby

Assistant Commandant:

BG Thomas J.P. Jones

JOURNAL STAFF

Editor:

MAJ Terence M. Freeman

Managing Editor:

Mary Corrales

Art Director:

Jean Halloran

Circulation Manager:

Jan McAdams

Field Artillery Journal

On the Move

MG JOHN S. CROSBY

The field artillery must survive to accomplish our mission.

As you know, we made survivability one of the major topics of discussion during the recent Senior Field Artillery Commanders' Conference. In visits to the field we found that many units were giving short shrift to survivability.

We know that even if the threat artillery performs random targeting, we can expect a significant amount of incoming. And the chances are that the targeting won't be random since the threat is procuring an increasingly more sophisticated target acquisition capability. So, if we want to be able to provide the fire support required by our maneuver commanders, we must develop viable survival techniques and make them an integral part of our training. That was the thrust of our discussions at the Commanders' Conference, and here is a brief summary of our observations and conclusions.

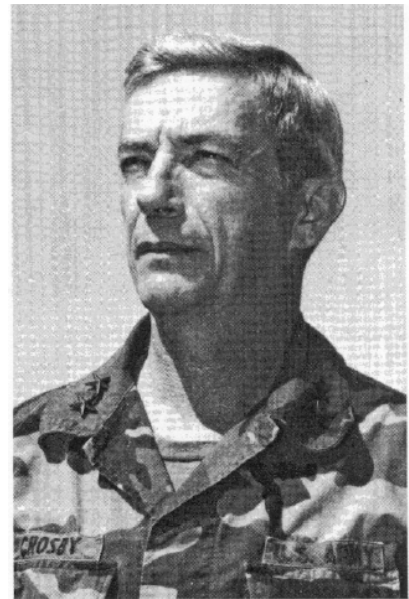
While we recognized that we are subject to attack by offensive electronic warfare and by ground and air forces, we concentrated on surviving the attack of our greatest threat — the enemy's artillery. FM 6-20-1 lays out the basic tactics rather well — depending upon the enemy's capabilities to detect and attack us, we must select the appropriate combination of dispersion, hardening, or movement.

We concluded, not surprisingly, that dispersion remains the tactic which hinders enemy detection and effective attack the most and costs us the least in terms of soldier labor and resource expenditure. In my own judgment, if we don't disperse, we are going to take unacceptable losses. But there is a cost to dispersion; command and control and communications become increasingly more difficult the greater the separation between our units. Firing platoons in one field artillery

brigade recently experimented with various separation distances and found that separation distances of 500 to 1,000 meters were best for C³. They also experimented with the type of dispersion — i.e., using single guns and pairs of guns in various tactical situations. But whatever distances or type of dispersion a field artillery commander selects, it's clear that we need to improve our intrabattery communications and our howitzers' onboard capability for determining position and lay. That is why we are campaigning for on-board radios (PRC-68s) for the gun sections and an improved howitzer that provides automatic gun positioning and lay.

Dispersion alone, however, will not guarantee our survivability. When we are accurately targeted, we need to be able to survive the attack; and so hardening is mandatory in some degree in any unit position. Commanders can manage some hardening with unit resources; battery soldiers can dig fox holes for themselves and, until the FAASV is issued, continue to provide protection for their ammunition. Other resources for hardening must be coordinated with engineer units. But engineer resources are a scarce commodity, and digging-in a howitzer beyond hull-defilade provides a very small increase in survivability. Therefore, they have turned their attention to effective use of the surrounding terrain — urban terrain, for example, can provide an abundance of cover as well as concealment. We are also investigating the need for hardened command-and-control vehicles for the battery; i.e., perhaps an M113 for the battery commander.

Frequent moves also improve survivability. As you know, any move detracts from providing continuous fire support. Leapfrogging batteries and platoons is an answer, but C³ becomes that much more difficult. Reports from one brigade concluded that its firing batteries could



effectively manage no more than 2 to 3 relatively short survivability moves in a day and that the battalion tactical operations center could sustain 1 to 2 such moves a day. Whatever the frequency, the mission, troop fatigue, the availability of real estate, and survey play a part in the commander's decision. PADS is a superb piece of equipment that has already significantly enhanced our ability to move. On the other hand, there was no consensus on the use of camouflage nets. While they assuredly help us to avoid detection, they also make it more difficult for us to pick up and move easily. We will take another look at their use.

The remainder of our discussion was fairly wide-ranging. We discussed signature, the ability of precision-guided munitions to decrease our vulnerability in this area, and the survivability of our special weapons operations. I have tasked the School to publish a draft field circular on survivability by October of this year. I want you to read it and let me know what you think.

The field artillery must survive to accomplish our mission. The maneuver arms are counting on us.



Incoming

LETTERS TO THE EDITOR

FIST and the Bradley fighting vehicle

I am a fire support team (FIST) chief attached by my parent field artillery battalion to a mechanized infantry company. During a recent field training exercise, my FIST had the opportunity to work with the infantry's new fighting vehicle, the Bradley or M2. We were to take part in a field testing program that was being conducted in the training area.

The extent of our training with the Bradley consisted of learning how to use the integrated sight unit, which is a sophisticated optical device on the M2. Some of my men were able to use the integrated sight unit to call in fire missions while the M2 was stationary. Our training was supposed to include fire missions while the M2 was moving along a mobile forward observer course; however, there were firing restrictions which prevented this part of the program.

Working with the Bradley fighting vehicle was certainly very exciting, but I believe that its role in a mechanized infantry unit is not compatible with the FIST concept as it is executed in mechanized infantry units equipped with the M113 armored personnel carrier. For example, one of my artillery supervisors asked me where we were going to put a platoon forward observer in the Bradley. Well, after I talked it over with several of my FIST chief colleagues, we concluded that there is no suitable space for the platoon forward observer in the Bradley.

If a platoon forward observer is to do his job properly in a mechanized infantry unit, he needs to be with his platoon leader. He also needs visual contact with the battlefield so that he can remain oriented, be responsive to the platoon leader's fire requests, locate targets of opportunity, and at least be able to adjust fire with a pair of binoculars.

Even though there are places on the M2 where the observer could perform his duties, none of them are as suitable as the cargo hatch of an M113 where the forward observer is located right next to the platoon leader. A possible location for a forward observer on the M2 is in the commander's hatch, but this location is not practical because the platoon or squad leader could not effectively control his

unit if he sacrificed his space to the forward observer. Another possible location for the forward observer would be in the gunner's hatch; but the TOW missile system, the 25-mm cannon, and the 7.62-mm coaxial machinegun are all fired from this location. Even if the forward observer were trained to operate these weapon systems, he could not effectively fire the weapons and perform the duties of the forward observer in combat. A final consideration for a location for the forward observer on the M2 is the cargo hatch, but the cargo hatch cannot be opened when the Bradley weapons are firing; and, even if the forward observer did stand in the cargo hatch, his line of sight would be obstructed by the turret and he would not be able to engage targets to his front and sides with indirect fire.

My recommendation to solve this problem is to restructure the FISTs which will support mechanized infantry units equipped with the Bradley fighting vehicle. I propose a FIST similar to the one that supports armor battalions — eliminate the FIST forward observers and have the FIST chief train the platoon leaders to call for indirect fire.

The Bradley fighting vehicle is a valuable asset to our Army. Before it is implemented Army-wide, however, the present infantry FIST structure needs to be changed so that the FIST can effectively contribute to the combined arms concept.

Warren R. Starr
1LT, FA
APO New York

FOs and the CIB

Recent combat action in Grenada demonstrates the need for a Combat Field Artillery Badge. Of particular concern to me is the forward observer. As an "Infantryman," he receives glory from neither the Field Artillery nor the Infantry when it comes to recognizing his accomplishments in combat. The forward observer is up front with the infantry at the cutting edge of battle, exposed to the same hazards, and often performs an infantryman's duties as well as his own duties; yet he receives nothing. The Combat Infantryman Badge cannot be awarded because the forward observer

does not have an 11-series MOS. Yet, his own branch has nothing to offer for recognition of his participation in combat.

I believe that this lack of formal recognition from the Field Artillery seriously undermines the morale of the soldier and should be corrected. There needs to be a Combat Field Artillery Badge.

Thomas M. Dowler
CPT, FA
B Company, 2d Bn
(Ranger),
75th IN
Fort Lewis, WA

Tricks of the trade

It was with some interest and a few chuckles that I read Lieutenant Colonel Thomas Swain's article "Freeze Frame" (March-April 1984 *FA Journal*). Having been a tactical communicator for over 17 years, I found some of the situations that occurred in Alaska somewhat ironic and somewhat humorous.

The article pointed out that there is a lot to be learned about communications in arctic regions. Not only does the temperature affect equipment; but the location of the equipment, the terrain, and the climate also create situations that are not in the norm of communications theory and practice. Most tactical communications are conducted with FM, line-of-sight equipment. Mountainous areas will block line-of-sight signals and can degrade communications. On the other hand, a mountain covered in snow and ice can be used as a reflector and can increase the range of communications, which might have been the case when a unit talked 70 kilometers in one direction and was not able to communicate 6 kilometers in the other direction. A thorough map and terrain analysis which will determine line-of-sight should be part of the preparation to occupy any new position and, in fact, is a technique taught to every 31V communications chief in his basic course. This line-of-sight principle might also explain the "layering effect" Lieutenant Colonel Swain describes — by raising or lowering the OE-254 or RC-292 antenna, various combinations of line-of-sight and reflection can be used to either mask, extend, or improve FM communications.

Another critical factor affecting communications is the ability to ground antennas. Water is a good grounding conductor. But, when that water turns to ice, it seems to insulate itself from the ground and thereby poses problems. Antennas use the ground as a counterpoise to lift and direct signals. Without that ground (counterpoise), the transmitter "sees" only half of the antenna, which puts an excessive load on the transmitter, thereby weakening the equipment and the radiated signal by reflecting radiated energy back into the transmitter. Grounding devices, therefore, become very important. Ground rods should reach below the frostline whenever possible, or else the frostline can be chemically or mechanically altered. Generous applications of sodium chloride (table salt procured from the mess hall) around a ground rod driven into the earth will usually achieve a good ground. Using the exhaust from a vehicle to thaw frozen ground around a ground rod can also help.

Last but not least, when it is time to put on gloves and parkas, it is also time to bring out the old equipment technical manual. Each technical manual has a section which explains operations under unusual conditions. This section gives procedures on maintenance and preventive maintenance, as well as procedures on the little "tricks of the trade" that are usually learned from hard experience; i.e., keeping freezing moisture out of the important works. Rubber cables and electrical cords get brittle and break in extremely cold temperatures and should be handled with tender loving care. The key to good, reliable communications lies in knowing your equipment and the effects of the environment on its capabilities.

I hope that these hints will make the next "freeze frame" a more communicative experience.

Harald W. Malloy
SSG, USA
Fort Sill, OK

Logistical support operations

The May-June and July-August 1983 issues of the *Field Artillery Journal* each contained an article which touched upon field artillery logistical support operations.

Colonel McVeigh's article "Your Right to Survive" mentioned how his battalion operated out of a consolidated trains. He also stated that his resupply was accomplished at a remote site with an en

route rendezvous and transfer of supplies.

Captain House's article "Rearming and Refueling" touches upon a semi-fixed operation whereby the gun battery comes into a trains or S1/S4 area to resupply.

My battalion is a 105-towed unit which operates in a manner similar to that of Colonel McVeigh's unit, but with some rather unique changes. The S3 and the S4 establish two resupply points which are located in different areas and have different time windows. If for some reason there is no resupply at the first point, a rendezvous can take place at the second point. This technique gives the battalion flexibility and limits the exposure time of the supply trains.

When a gun battery arrives at the rendezvous location, each gun pulls along the side of an ammo truck. These ammo trucks carry class I and II supplies as well as the class V supply. The supply point has one ammo truck per prime mover, each one loaded with a specific gun's load. The prime mover is positioned in such a way that its fuel tank is on the opposite side from the ammo truck. In this way, although for safety reasons the units have not yet refueled and rearmed simultaneously in training, they are in the correct position to do so in the combat environment.

When the prime movers are in position, then 10-foot rollers are slid out from the side of the ammo trucks to the side of the prime movers. Ammo, C-rations, mermite, and other supplies are then slid over the rollers. While this transfer of supplies is occurring, two vehicles at a time are receiving fuel. When the resupply operations at both points are completed, the resupplying batteries move out in opposite directions; and the battalion has already achieved dispersion.

I have not performed the combined rearming and refueling operation, but I have done the rearming in under three minutes. This operation is highly flexible. It can be done on the side of a road. The convoy can be spread over great distances and around corners. Ammo vehicles can be placed on a slight elevation in order to use gravity in the transfer of supplies over the rollers.

The advantages of this technique are increased survivability, no exposure of battery firing areas, and an efficient, fast, and smooth resupply operation. My unit has been operating under this concept for several years and has found it to be highly successful. As Captain House stated, "we in logistics would like to know how other S4s handle this problem."

Albert J. Tonry II
CPT, FA (MAANG)
Boston, MA

DMD for Met

As the meteorological technician of the 1st Cavalry Division Artillery, I have had the opportunity to observe many aspects of field artillery operations. The capabilities of the AN/PSG-2A digital message device (DMD) gave me the idea of using the DMD to transmit meteorological messages. As you know, the DMD transmits high-speed, digital messages and can communicate with TACFIRE, the battery computer system, the variable format message entry device, and other DMDs through wire or standard Army radios. After discussing the idea with other meteorological technicians and members of our division artillery S3 section, I conducted a series of tests. I concluded that meteorological messages can be transmitted by DMD using the FREETEXT (plan text message) format.

Before we could send any messages by means of the DMD to either a division artillery or battalion tactical operations center TACFIRE, we had to be on the subscribers' list. All coordination between the sender and receiver had to be accomplished prior to transmitting messages by DMD, or else the messages were not accepted. We decided to connect two DMDs in parallel since one DMD's memory did not allow us to store an entire meteorological message in the format we desired. We also entered the meteorological data one line at a time to avoid confusing the TACFIRE computer operator. To transmit, we recalled one line at a time, verified the data, and then transmitted the data. This procedure took only 10 minutes from the time we entered the meteorological data into the DMD until we received confirmation that all firing batteries received the met messages.

During a field training exercise conducted this past December, we transmitted computer and ballistic meteorological messages in a tactical environment for the first time. Now the DMD is the primary means of disseminating meteorological messages in our division artillery meteorological section. The radio teletypewriter had been our primary means of transmitting met messages; but it does have a significant electronic signature, and it requires significant operator sensitivity to the

proper phasing between the transmitting and receiving stations. These facts make the radio teletypewriter a less desirable method of transmitting met messages. Voice radio systems, which we often use, require lengthy transmission periods which in turn result in transmitting and receiving errors.

Not only is the DMD a more effective dissemination method, but it also reduces transmission time, thereby increasing the combat survivability of a meteorological section. For meteorological sections in units with TACFIRE systems, the DMD offers a temporary solution to problems which the new meteorological data system will help alleviate when it is fielded.

Jack R. Morgan
CW2, AUS
Fort Hood, TX

While noting that the radio teletypewriter is still vital for disseminating many types of meteorological support, subject matter experts within USAFAS view your proposal to use the DMD to transmit computer and ballistic meteorological messages as (1) a good way to enhance the integration of meteorological sections into the TACFIRE environment prior to the fielding of the meteorological data system and (2) a good way to reduce the use of FM voice for transmissions of meteorological messages. They do make one point about your problems with storing an entire meteorological message in one DMD in the format you desire. One DMD can store 11 zones (or lines) of computer meteorological data and 8 zones (or lines) of ballistic meteorological data. While an untrained TACFIRE operator might have trouble understanding the format of this data, it probably is more cost-effective to train unit personnel to understand the format than it is to bring in a second DMD. — Ed.

Countering opposing force radar detection

I am a fire direction center section chief, but I have little or no knowledge of ballistics beyond meteorological and velocity error computations. I have become increasingly alarmed at the opposing forces' capability to find field artillery units through radar detection.

There must be an additional way to confuse their radar over and above

dispersion of the battery front and constant movement. Can we not produce a round that will eject a cloud of aluminum foil at the peak of its trajectory and thereby confuse threat radar?

Marvin J. Epstein
SSG, FA (NYARNG)
Jamaica, NY

The subject matter experts within the Field Artillery School's Directorate of Combat Developments offer these thoughts in response to your question.

You are right to be concerned by the opposing forces' radar detection capability, but we must balance this threat against other threats facing our units. The fire support community's basic responsibility is to support the maneuver commander, which means that what we attack is selected on the basis of how it fits into the commander's plans. Radar systems are a part of the opposing forces' electronic combat forces and are attacked based on the priority assigned them by the maneuver commander.

From the maneuver commander's standpoint, the greatest impact on his freedom of action may be threat lethal attack systems such as tanks, armored mechanized infantry vehicles, and artillery. Even though the Field Artillery School's 1981 target value analysis listed many high-value targets that are not frontline combat units, the close support mission of the field artillery is such that a strong requirement for the attack of opposing force maneuver units will always exist.

Given this emphasis on supporting the close-in battle at the forward line of own troops, there is only so much ammunition left over to attack nonlethal systems or systems which are lethal only indirectly. This category is where most radio electronic combat assets fit in. You are probably aware that the field artillery already has over ten 155-mm cannon rounds and several times that many fuzes. The various rounds are designed to permit the attack and defeat of a wide diversity of target types, and several of them will effectively kill opposing forces' radar systems.

One of the field artillery's most pressing problems, however, is the lack of an adequate target acquisition capability — systems which permit finding and consequently attacking and killing radar systems such as you mention. While the Branch is not there yet, it is making progress in developing these systems.

You are correct in saying that aluminum foil will confuse radars; it is called chaff and has been used in aerial warfare since World War II. Virtually all attack aircraft in the world include on-board chaff dispensing systems to protect the crew of the aircraft. In a ground support role, the chaff round does not have that degree of priority. First, it does not kill anything; and the field artillery's first priority must be to kill those targets it can locate. Second, as I mentioned earlier, since rounds exist which can protect field artillery units from the threat radar by killing it whenever it is located, the Branch has opted to put most of its limited funds into target acquisition systems which can detect these opposing forces' systems and many other equally pressing threats — Ed.

Final protective fires

Captain Patrick C. Sweeney ("Keep the Fires Burning," January-February 1983 *FA Journal*) clearly has lost the main reason for final protective fires (FPFs), which is to break up the final assault waves of an enemy surprise attack on a key location. Captain Sweeney ably and accurately describes the theory of priority targets, and I sympathize with his logical outline of the requirement for field artillery fires in the defense. There is, however, a clear distinction between a priority target and final protective fires. This distinction is not clearly outlined in any doctrinal publication, but it most definitely should be. Final protective fires represent a priority target; however, as Captain Sweeney so aptly points out, it will never be the most important "target of the moment" until it is too late to ask for it.

Final protective fires will not and should not be given to every fire unit or to every maneuver unit. Several fire units may have the same final protective fires; the same maneuver unit may have several fire units on its final protective fires. By not allotting every unit the final protective fires task, we leave units free to lay on other priority targets. It is the commander's choice where he wants to weight his defense by fire. A final protective fire task does not preclude a fire unit from bringing its guns to bear on other targets. Nor do final protective fires become the "property" of that fire unit which has been assigned the target. Other guns can and will be brought to bear as

quickly as possible if final protective fires are fired.

Final protective fires were designed, for example, for the lonely grunt private in his foxhole whose first sight is the enemy on his wire, in force, at night. "FPF fire" should be the only command necessary at each location, including the fire unit. The ammunition should be as standard as possible to minimize the time delay. The amount of fire should be standard and prescribed in unit SOPs. The object is neither destruction nor neutralization nor any quantifiable result. It is more of a holding action, a fast punch blindly struck at an enemy as yet undescribed. This type of situation precludes adopting Captain Sweeney's recommendation that we open fire at a safe distance from friendly forces and then march the final protective fires back toward the point of the enemy's strike. Final protective fires, if unadjusted, will result in the death and injury to some friendly forces; and this is not acceptable, no matter how much trouble that they are in. Also, friendly forces will be better protected from the effects of friendly field artillery fires as long as the munitions are high explosive/fuze quick and not variable time fuze or any sophisticated ammunition such as DPICM, FASCAM, etc.

In summary, final protective fires are allotted based on the maneuver commander's guidance. They should be simple targets, fired with simple standard ammunition, with speed as the very essence of the exercise. If any change should be made in the doctrine for final protective fires, the firing unit should be looked at. Allied armies load the guns fully and leave a gun sentry on duty to man the lanyard and fire the first volley when "FPF fire" is the order. This procedure has inherent problems but does increase response to the call for final protective fires and should be considered if the situation dictates.

P.I. Rose
MAJ, Royal Artillery

Captain Sweeney happened to be passing through Fort Sill when your letter arrived. I showed it to him, and here is his reply — Ed.

"I agree that the battle-tested technique of "firing in" final protective fires (FPF) is the best way to employ the FPF. However, Major Rose does not address what I presented as a problem in my "Keep the Fires Burning" — are we going to be able to have the chance to fire in our final protective fires in the next war? I think not. Then what? The doctrine

July-August 1984

solution (FM 6-30) states just what Major Rose and I both say is wrong; i.e., calling the FPF in without adjustment. My article presents a safer alternative to that problem.

"Major Rose also indicated that 'a final protective fire task does not preclude a fire unit from bringing its guns to bear on other targets.' I agree; however, if the battery is laid on FPF data during lulls in the battle, then the unit cannot be laid on a priority target, which means that the maneuver company commander cannot receive the fast fires of a priority target in his engagement area except when his unit is being overrun.

"Major Rose said that final protective fires are used to 'break up the final assault waves of an enemy surprise attack. . . .' Again, our doctrine mentions nothing of the limiting of FPFs to only surprise attack or 'just at night.'"

Comment and question

One comment, one question. First, the comment. In the November-December 1983 *Field Artillery Journal*, you stated that the home base for the 8th Field Artillery Regiment was Fort Bragg, North Carolina. But the home base of the 8th Field Artillery Regiment is Schofield Barracks, Hawaii.

Now the question. In the article, "One on One with 3x6" written by Lieutenant Colonel Helms, there are several pictures of the M102 howitzer with dual tires. Is this modification peculiar to airborne units? Is there a good reason or a modification work order (MWO) which indicates the necessity for duals of the M102? It would appear that this modification might improve stability of the weapons system, thereby reducing possible damage to the howitzer. Lastly, if this modification is authorized for a towed unit, can you forward plans or special equipment required to do the modification?

Donald J. Schmus
MAJ, FA
Schofield Barracks, HI

You are absolutely right — the Office of the Deputy Chief of Staff for Operations reports that Schofield Barracks is one of the few OCONUS regimental home bases. The final decision was made after the November-December issue went to press.

I talked to Lieutenant Colonel Helms about the dual wheels on the M102. It was not an approved MWO but an

experimental MWO being investigated by his division artillery. He also said that the dual wheels do improve traction on loose and sandy soil, offer better stability, help provide extra cushioning for the howitzer as it traverses rough terrain, and provide a readily available spare. — Ed.

Target Acquisition Warrant Officer Conference

I read the announcement for last year's Target Acquisition Warrant Officer Conference in the "View from the Blockhouse" section of the July-August 1983 edition of the *Journal*.

The target acquisition conference needs to highlight problems and encourage general dialogue within the entire Field Artillery Community; however, it appears that these conferences focus on only the target acquisition community and not the Field Artillery Community as a whole. This year's conference was even worse because it focused on only meteorology and radar warrant officers. Both the meteorology and radar sections work extremely well in fulfilling their mission in support of division artillery units, but the other sections of a target acquisition battery usually have low visibility and often support division artillery units only by giving up their section jeeps, radios, and personnel. It is critical that we start focusing on the sound/flash section — sound/flash is more accurate than radar in locating targets and is a good resource for conducting registrations. However, many fire direction officers and battalion commanders seem not to be educated in its resourcefulness. I have these recommendations:

- Focus target acquisition conferences on an investigation of the weak areas within a target acquisition battery. Its manpower and equipment need to be upgraded.
- Upgrade sound/flash or else delete it altogether and use the personnel where they will better benefit the field artillery and the US Army.
- Educate the military community on the need to bring target acquisition out of the dark ages into modern times.

Paul C. Adams
SFC, 17C40
C Btry, 333d (TAB) FA
APO New York

Closing the gap

By November of 1983, eight division artilleries and four field artillery brigades — fully one-half of all major Active Army field artillery units — had been equipped and were training and operating with the TACFIRE and the battery computer system (BCS) automated command and control systems. By 1986, more than 90 percent of Active Army field artillery units will possess these systems. Unfortunately, much of the TACFIRE and BCS potential for improving fire support is going unrealized.

At fault is the TACFIRE doctrine gap — the time lag between the fielding of new equipment or technology and the publication and implementation of new tactics designed to fully exploit its new capabilities. The Field Artillery Community must close this gap if the full potential of automated command and control is ever to be realized. There are historical examples of the adverse effect of doctrine gaps on an army. Perhaps the most obvious is the 20-year lapse between the introduction of the tank in World War I and the development of doctrine for the massed use of armor in World War II. In 1940 inferior German tanks routed the French Army because French doctrine failed to exploit the technically superior French equipment.

Despite the abundance of such examples, the US Field Artillery Community is in danger of falling into the doctrine gap with its TACFIRE and BCS systems. In 1977, the 1st Cavalry Division received the first TACFIRE system. But in the intervening years, writers of field manuals have virtually ignored TACFIRE/BCS capabilities, requirements, and operations; there has been practically no dialogue on TACFIRE operations in the *Field Artillery Journal*; and there has been little input from the field to the Field Artillery School and a similar lack of response back to the field. It is in these areas that all field artillerymen must work to close the doctrine gap.

Field manuals

FM 6-1, *TACFIRE Operations* (September 1979), is the closest thing to a TACFIRE how-to-fight manual; but it is primarily a general description of capabilities and does not tell units how to employ the system tactically. As a general explanation of what TACFIRE is and can do, the manual is more valuable to those unfamiliar with TACFIRE and BCS than it is to actual TACFIRE users. One hopes

that the new FM 6-1 (currently in draft form) will address these topics, for units will continue to suffer until there is adequate discussion of —

- The methods for providing adequate coverage to all maneuver tactical operations centers (main and jump).
- The pros and cons of various mutual support options (for example, direct support-direct support or direct support-general support).
- Split-battery operations with and without BCS.
- The use of a jump tactical operations center in a battalion equipped with TACFIRE.
- Tactical results of specific elements of the commander's criteria.
- 24-hour operations in units equipped with TACFIRE.
- The effects of mutual support on fire support teams (FISTs), fire support officers (FSOs), and firing batteries.
- Operations in composite (MLRS-cannon) battalions.

Both FM 6-20, *Fire Support in Combined Arms Operations* (January 1983) and FM 6-20-J (Coordinating Draft, December 1983) are excellent documents for manual or non-TACFIRE field artillery units. But these manuals are not much help to fire support personnel in units equipped with TACFIRE and BCS. In the discussions of duties and responsibilities of fire support personnel, TACFIRE seems to be an afterthought — and an incomplete one at that. There is an inadequate treatment of the procedures for accomplishing the following tasks associated with TACFIRE:

- How to clear fires (since the FSO no longer hears the call for fire).
- How to put together a fire plan (since TACFIRE procedures parallel, but differ from, manual procedures).
- How to include mortars in fire plans.
- How to conduct chemical and nuclear target analysis.
- How to input and retrieve artillery target intelligence data at each fire support element level.

Further, there is no discussion of TACFIRE's impact upon fire support operations in the following areas:

- How to provide TACFIRE coverage to both main and jump maneuver tactical operation centers.
- The blurring of field artillery missions due to mutual support assignments (i.e., when a general support battalion is mutually supporting a direct support battalion while the direct support battalion tactical operation center is moving, fire missions from observers

associated with the direct support battalion have equal priority with those from the force artillery headquarters).

- The ability to analyze targets for attack by air assets prior to requesting close air support.
- The allocation of target acquisition assets (especially aerial observers, since the division artillery computer cannot process adjust-fire missions or use gun-target direction).
- How to reassign a fire mission to mortars (since the FSO does not receive his copy of the fire request until after the computer has received and begun processing the mission).
- What FSOs and FISTs do during BCS autonomous operations.

In all of these areas, TACFIRE offers improved fire support capabilities; but the field manual does not even mention these topics. The absence of such discussion not only hinders personnel in units equipped with TACFIRE and BCS, but also causes serious problems for non-TACFIRE personnel who are assigned or attached to units using TACFIRE and who find no published guidance to help them understand the new system or its operational requirements. Interoperability becomes more difficult and less efficient, thereby degrading fire support. To claim that these procedures are more appropriate for a unit standing operating procedure (SOP) is as invalid as it is dangerous. Commonality of procedures is essential for two TACFIRE units to operate effectively. The less published guidance, the less commonality; and again interoperability suffers.

FM 6-40, *Field Artillery Cannon Gunnery* (December 1978 with two changes) contains absolutely nothing on TACFIRE or BCS. This fact is stated clearly in paragraph 1-2d: "This manual does not address fire direction procedures under the tactical fire direction/battery computer system." What is *not* stated is that there is no publication in existence which does discuss TACFIRE fire direction center procedures. Thus, fire direction officers must invent their own procedures for running a fire direction center with TACFIRE and BCS and modify manual procedures to accommodate and exploit their new equipment. Each unit struggles to do so in the absence of any Army-wide guidance or doctrine. Obviously, standardization is nonexistent. Having devoted much time and effort into standardizing M577 configurations, the Field Artillery School has yet to address (in its field manuals) such basic subjects as:

- The duties and responsibilities of

personnel in battalion and battery fire direction centers.

- The impact of mutual support operations on the operations of fire direction centers.

- Considerations for establishing commander's criteria used to ensure that computer solutions reflect the commander's guidance.

- Considerations for "jumping" the tactical operations center with TACFIRE.

- BCS autonomous operations.

- Dedicated battery operations with TACFIRE and BCS.

These shortcomings seriously affect the ability of 50 percent of Active Component field artillery units to perform their primary function — to shoot.

FM 6-50, *Field Artillery Cannon Battery* (March 1983) is similarly flawed. It fails to discuss the impact of BCS upon the following aspects of firing battery operations:

- Piece displacement limitations (based on the battery computer system's capabilities for terrain gun position corrections).

- The new data required by BCS for the executive officer's report.

- Digital fire commands received on the gun display unit, which vary somewhat from voice fire commands.

- BCS autonomous operations.

- The operations of the battery operations center in a BCS-equipped battery.

- Communication requirements (radio and wire) and battery and battalion net structures.

- Split-battery operations with BCS.

While FM 6-1 might be excused due to its age (1979), there is no excuse for the later manuals not to contain something on TACFIRE and the BCS. FM 6-20 and FM 6-50 are dated 1983, and FM 6-40 has had several changes since 1978. It is simply a case of doctrine writers ignoring the needs of a large segment of the Field Artillery Community, since as early as 1982 (*before* these field manuals were published) 25 percent of the Active Army field artillery units have had TACFIRE.

The shortcomings of these field manuals would be less critical if the operator's manuals for TACFIRE and BCS contained the necessary tactical guidance. But this is not the case. TACFIRE and BCS technical manuals, while voluminous and very detailed, only contain procedures required to accomplish specific tasks. They do not (and probably should not) contain tactical guidance on when to perform various

tasks, how to coordinate with other sections or units, or how unit operations should be conducted. The doctrine gap is thus evident where the technical manuals leave off and the field manuals fail to pick up. Units are told how to operate the equipment, but not how to use the system to accomplish their tactical mission.

Field Artillery Journal

The *Field Artillery Journal* often provides a forum in which articles can help compensate for shortcomings in publications and in which units can share ideas and techniques, but there have been very few articles in the *Journal* on TACFIRE and BCS. From March 1978 to September 1983, I can find only 11 articles which relate to TACFIRE and BCS. Of these only two discuss the tactical employment of TACFIRE (November-December 1981 and May-June 1982). The remainder are basic introductory articles designed to familiarize personnel in non-TACFIRE units with the equipment and are of no practical value to TACFIRE-equipped units which are struggling with how to employ it tactically to best advantage.

The problem lies primarily with units in the field. Either no one has learned anything about how to use the system in the last six years, or else they do not choose to share it with the rest of the Army. The result is a lack of dialogue on how to best use TACFIRE and BCS, and the doctrine gap remains as large as ever.

The School

The third potential source of help for units equipped with TACFIRE is "the School" — those departments within the Field Artillery School which are responsible for developing new field artillery techniques and doctrine. But the results here are also less than spectacular. The old *TACFIRE Newsletter* was discontinued. After a long hiatus, a new newsletter has emerged; but it is completely technical, not tactical, in nature. There is an annual TACFIRE Users' Conference, but it consists more of technical briefings by the School than of tactical dialogue with field units. At the 1983 conference, TACFIRE users/operators (units) were outnumbered by nonusers. The 1982 conference never even produced an after-action report, and there is no procedure to ensure that issues raised will be followed up by the appropriate School departments.

The School's less than aggressive campaign to seek input from the field

aggravates the situation. Draft field manuals apparently are sent to units for comment, but often are not sent to the three new equipment training teams in Europe, who are the primary tactical trainers of units receiving TACFIRE and BCS. This lack of input from field-experienced users is extremely detrimental. Worse yet is the frequent assignment of graduates of the 11-week TACFIRE course (who have no field experience with TACFIRE and BCS) to School departments with responsibility for doctrine. There is just no substitute for field experience, no matter how capable the individual. Everyone who has worked with TACFIRE in the field recognizes this fact. The result is "ivory tower" doctrine and publications, especially field manuals, which do not take advantage of the experience and expertise of personnel in field units and which do not meet unit requirements for sound, up-to-date tactical guidance.

It will require the efforts of the entire Field Artillery Community to propose, test, refine, and disseminate new tactics and techniques for best employing TACFIRE and BCS on the modern battlefield. The first priority is to revise current field manuals to reflect TACFIRE operations. There are two main directions that this effort may take. The first is to produce one complete TACFIRE how-to-fight manual which covers all tactical applications of the system (a super FM 6-1). This would necessarily be very large and in many respects redundant of the current topical field manuals. A better option is to revise the current topical field manuals and include tactical techniques and procedures used by TACFIRE-equipped units along with the techniques used by non-TACFIRE units. This option would be less unwieldy (requiring only 10 to 20 additional pages for each manual) and would avoid redundancy. It would also improve interoperability since it would make available to every unit the techniques used by both TACFIRE and non-TACFIRE units, all in one document. An action of this nature must be, and can be, done immediately. After six years' delay, there can be no more excuses.

To successfully accomplish this task, both the Field Artillery Branch and the Field Artillery School must carefully manage TACFIRE-experienced officers, not only to assure qualified replacements for TACFIRE units, but also to provide the various departments at Fort Sill with field-experienced TACFIRE "experts" capable of formulating sound tactical doctrine which meets the needs of

TACFIRE units. Although the new TACFIRE additional skill identifiers will help, field experience, not school attendance, is the key factor. Once in place, these individuals need to be aggressive in seeking input from the field on new ideas and techniques. One method of increasing input and feedback would be to hold a second TACFIRE Users' Conference which would consist of presentations by each major unit on the tactical employment of TACFIRE and BCS. In this way, units can share ideas with each other and provide input directly to the School in a face-to-face dialogue with those responsible for doctrine. No one has a monopoly on good ideas. Doctrine must take into account the ideas and experience of personnel in the field who know what the equipment can and must do tactically.

Every Redleg, to include those in the School, TACFIRE units, and new equipment training teams, must share ideas and problems with other field artillerymen. The *FA Journal* is the best forum for this dialogue. Problems can be raised and solutions shared. A TACFIRE column containing short articles or notes on technical or tactical procedures should become a standard feature, supplementing the more detailed technical information in the new *TACFIRE Newsletter*. After all, the readership now consists of a preponderance of TACFIRE users. Their ideas can provide a basis for the development of interim tactics and techniques pending publication of the improved field manuals.

In summary, everyone recognizes TACFIRE's potential for improving fire support. But, while 50 percent of the Active Army field artillery units have TACFIRE and BCS, the current how-to-fight manuals virtually ignore TACFIRE. The dialogue among the School and units in the field is inadequate. The Field Artillery Community must aggressively seek this dialogue and incorporate field-tested tactics and techniques in field manuals. Only then will the field artillery close the doctrine gap and be prepared to defend properly the Fulda Gap.

Forrest G. Clark
MAJ, FA
Fort Lewis, WA

I shared your thoughts with various agencies within the Field Artillery School. As you might imagine, you stimulated a good deal of discussion. Here are the more salient of the responses of various subject matter experts:

- *You expressed concern that the*

officers in the departments which are charged with formulating TACFIRE doctrine should be experienced in the field operation of TACFIRE. In the past, necessity forced the assignment of graduates of the TACFIRE Operator's Course to the TACFIRE Training Division even though they had no experience with TACFIRE in the field. There simply was no choice. But the Fort Sill adjutant general has now established a program which will ensure that officers coming to Fort Sill with field experience go immediately to School assignments, while those who lack field experience are assigned to III Corps Artillery to gain the necessary experience.

- *Since it takes 18 months to update a field manual, there will always be a doctrine gap of the sort you describe. Take, for example, the case of FM 6-1 — most of the inadequacies you described are addressed in revised FMs 6-20J, 6-20-1J, 6-20-2J, and 6-50; but these manuals will not be printed until September 1984, March 1984, June 1984, and March 1985, respectively. Coordinating drafts are provided to the field to beat the six-month time lag between printing and distribution, but the gap is still there.*

- *You are absolutely correct when you suggest that two-way communication between the field units and the School departments is essential. There simply is not enough constructive dialogue. When the coordinating draft of FM 6-1 went out to 67 addressees (including School departments, all major commands, new equipment training teams, and field artillery units with and without TACFIRE), only 20 addressees responded; and 16 of these responses came from within the Field Artillery School. The **TACFIRE Letter to the Field** was started to accommodate requests from field units, but responses to it now come largely from within the School or from the CECOM New Equipment Training Team. Although the 1983 TACFIRE User's Conference was advertised as a forum for dialogue between subject matter experts within the School and experienced TACFIRE soldiers from the field, few field units prepared presentations of their viewpoints; and many attendees from the School came expecting to be taught rather than to share in the resolution of tactical and technical problems.*

- *Rather than pinning more hopes on a second TACFIRE User's Conference, it might be wiser if we promoted the discussion of TACFIRE in the Fire*

Support Conference.

You have focused on a legitimate problem. There are initiatives underway to solve the problem, but the key will be the willingness and ability of the field and Schoolhouse to join forces to close the gap. — Ed.

An out of transfer technique

How often has this sequence of events happened to your firing battery? The situation is fluid. The battery has just occupied a new position and the executive officer and chief of firing battery have just completed the laying process. Collimators and aiming posts are set to the front. Suddenly the fire direction center receives a call for fire on a target which is approximately 3200 mils out of the azimuth of fire. Aiming posts to the rear are not available, and the terrain does not lend itself to the selection of a distant aiming point. The forward observer needs steel on target *now*. What does the executive officer do? Does he dash across the firing point to re-orient an aiming circle on the new azimuth of fire? Does the fire direction center even have an opportunity to inform him of the new azimuth? Does he or the chief of firing battery command the sections to lay by M2 compass independently or have one gun lay itself and then reciprocally lay the remainder of the battery? The "School" solution so often suggested seems to be that "this is an emergency mission to the rear, and so we should lay by M2 compass and accept the inherent error for speed because the forward observer needs immediate fires and can adjust after the first round." FM 6-50 has set an accuracy standard of 100 mils within the actual azimuth of fire as successful completion of laying by M2 compass. Although field conditions, fatigue, and pressure strongly influence battery commanders to be satisfied with between 100 and 200 mils as an acceptable error using this method, this error is unacceptable for survivability on the modern battlefield.

Another solution does exist; and its speed, accuracy, and simplicity warrant significant notice. The method requires one simple command and makes use of currently emplaced aiming posts. It takes place at section level, generally in less than 30 seconds and with an accuracy of between 0 and 3 mils. Here is the procedure. The FDC receives the out-of-transfer mission and computes the initial azimuth to target. This computation can be performed manually, but we suggest normal

TI-59 computation procedures. What follows is a simple mathematical step:

- Subtract the new azimuth of fire from the old azimuth of fire to derive the value X. (Add 6400 if the new azimuth is greater than the old azimuth.)
- If X is less than 3200, add 3200 to this value. If X is greater than 3200, subtract 3200 from this value.
- The resultant value is the deflection to the target.

From a quick visual check of the new gun-target line, the fire direction center can determine whether the target is far enough out of transfer limits to require an appropriate warning command to the guns — this command will save gun sections time as the fire direction center completes the computation of the new data to fire. We recommend the warning command of "Azimuth, azimuth shift (give new azimuth)" because it worked well for us. It identifies to all section members that an out-of-transfer or major-shift mission is to be fired, and it furnishes the new azimuth of fire to the sections. Upon receipt of this command, the gunner immediately goes to his aiming posts and punches out 3200 on his counter-reset. Then he refers to the internal azimuth markers and traverses to approximately the new azimuth of fire, re-orienting his pantel and ballistic shield to the aiming posts. The fire direction center by this time has computed the new deflection to target, based on the original azimuth of fire, and sends it to the guns to be set off in the same manner as a normal mission with one exception — upon completion of the adjustments, the gunner will again punch out 3200. The previous deflection to target is now deflection 3200 and is the primary azimuth of fire — the battery is ready to fire. This process can deliver rounds downrange in less than 60 seconds with adequate training and practice. It is accurate to within three mils, requires few commands, and can be accomplished quietly with little confusion. It is worth a little practice.

With aiming circles at a minimum within a firing battery and many positions not conducive to alternate lay to the rear, this method offers the battery some lucrative benefits. Figure 1 outlines actions which must take place. Think about it.

W. Bruce Turner
1LT, FA
Roberto N. Burdios
SSG, USA
Fort Stewart, GA

Fire direction center	Gun sections
<p>1. Receives new target; visual check shows target will be out of transfer.</p> <p>2. Issues warning command of the new azimuth of fire.</p> <p>3. Computes deflection to the new target. Subtracts new azimuth of fire from old azimuth of fire (adds 6400 to old azimuth of fire if necessary). The result is the uncorrected deflection. Note: <i>If the uncorrected deflection is less than 3200, then add 3200. If the uncorrected deflection is greater than 3200, then subtract 3200. The result is the deflection to the new target.</i></p> <p>4. Sends deflection to guns.</p> <p>5. If necessary, re-orient charts with the azimuth to the new target as the new azimuth of fire.</p>	<p>Receive warning command; gunners go to aiming posts, punch out 3200, traverse to the general azimuth of fire, and re-orient pantel/ballistic shield.</p> <p>Set off deflection, take up displacement, adjust, and punch out 3200.</p> <p>Fire.</p>

Figure 1. Out of transfer technique.

The Gunnery Department subject matter experts find your procedure technically correct and applicable for howitzers with a 6400-mil capability. Your method is a variation of the azimuth/deflection relationship (RALS/LARS) method. A simpler procedure would be to place azimuth indexes for the battery on the firing chart as a part of position improvement. These azimuth indexes help in providing a 6400-mil capability and speed up the reaction time for out-of-transfer and out-of-traverse missions. The procedure for establishing azimuth indexes is in FM 6-40 (with changes 1 and 2), chapter 3, paragraph 3-8. Most field artillery units are equipped with a TI-59 and a FADAC or a BCS, and hence they can provide timely and accurate firing data for out-of-transfer missions.

The Weapons Department subject matter experts applaud your attention to this type of mission. While the scenario you describe is not a typical occurrence, it does call for sound procedures to put steel on the target. These experts do caution, however, that FM 6-50 gives the tolerance for laying a howitzer as 0 mils, not 100 mils. The experts also admit the accuracy of your method of determining the deflection to fire, but recommend the "backward azimuth" rule as a simpler method. While your command "Azimuth, azimuth shift" has proved useful to you, it would serve standardization better if you were to use the special instruction "Azimuth (so and so) (azimuth to the target)" to denote a large shift in direction. Lastly, it might be a better idea not to counter-reset

since the fire direction center would then need to relay its chart and then do it again when the howitzer returns to the primary zone of fire. — Ed.

SEAD and FIST

Captain Ron Johnson ("SEAD — Are we ready?" May-June 1984 *FA Journal*) makes a valid point about the lack of FIST training in the identification of threat vehicles and weapon systems. But he is wrong when he states that suppression of enemy air defense (SEAD) is a primary role of the field artillery. It is nothing more than another fire support task which will fluctuate between the field artillery's least and most important priority depending on the tactical situation. Captain Johnson overstates the FIST's responsibility in regard to SEAD. SEAD for any operation is best planned at brigade or higher level. The FIST's input is target identification and location and adjustment of fire. The assets needed to fire a meaningful SEAD program are rarely available at brigade level unless other close support operations are stopped. General support and general support reinforcing battalions would be assigned these tasks; and the division fire support element, collocated as it is with the division management element, is ideally suited for planning SEAD.

P.I. Rose
MAJ, Royal Artillery

Memories of Punchy

When I wrote "Recollections," (which appeared in the July-August 1983 edition of the *Field Artillery Journal*), I also had in mind telling today's field artillerymen, especially those with similar assignments, what it was like to be a forward observer during World War II. So here is a little background and one day of combat which I particularly remember.

I was assigned to the 696th Armored Field Artillery Battalion, which was in combat for 9 1/2 months in the European theater of operations. The 696th was commonly called a "bastard battalion" because it was not assigned on a permanent basis to any army, division, or corps. It was variously assigned to two armies, six corps, two cavalry groups, and eight divisions. It covered 2,275 combat miles and expended 75,974 rounds of ammunition. By the war's end it had earned five battle stars and had been awarded the *Croix de Guerre* with Palm by the French government.

The battalion had a headquarters battery, a service battery, and three firing batteries. Each firing battery had six M7 ("Priest") self-propelled 105-mm howitzers. The forward observer section was assigned to the headquarters battery. There were three lieutenants. A lieutenant in the field artillery during World War II had an awfully good chance of winding up as a forward observer or a reconnaissance officer. The forward observers were not the only ones who observed and adjusted artillery fire on enemy targets. The battery reconnaissance section was, in many cases, assigned to the attacking infantry companies and platoons — so were motor officers. They performed the same function as the forward observers performed, and so did the pilots of our two L-4 liaison planes. Replacements for wounded or captured forward observers and reconnaissance officers were either their sergeants, officers from other batteries, or officers from the replacement depot.

The forward observer section also included 15 enlisted men, three jeeps, and three M4 Sherman tanks — the only tanks in the battalion. The tanks had a 75-mm gun, two .30-caliber machineguns, and one .50-caliber gun mounted on the turret of the tank. The tank commander was the forward observer. The tank commander/forward observer, the gunner/forward observer sergeant, and the loader/radio operator were in the turret of the tank. I was the bow gunner, operating the .30-caliber machinegun located in front of the tank, opposite the driver. My



Left to right on Punchy are Corporal Charles Falls, Sergeant Frank Lazauskas, Lieutenant Charles Olmstead, Private First Class John McMahon, and T-4 Sergeant Donald T. Ahrens.

tank was named "Punchy" — it had two boxing gloves painted on the tank below its name. Although we went through the war in that tank, we never thought of ourselves as anything but field artillerymen.

It was not unusual to have three batteries firing on three different targets at the same time. In some situations, it was hard to pick up the initial round for adjustment because there were so many artillery and tank rounds landing in the target area. In these cases, the forward observer would request a high airburst or smoke (white phosphorous) for his initial round. If fighting was heavy and additional fire was needed on the target, the forward observer would request division or corps artillery fire for a time-on-target concentration.

In order to keep pace with the maneuver forces in rapid-moving situations, either one battery was ready to fire as the battalion moved forward, or else one battery moved forward and operated its own fire direction center until the battalion moved forward to its location. There were also times when the 696th was in a stationary position for several days and engaged the enemy with a definite frontline. Before nightfall, the forward observer would meet with the tank or infantry commander and set up harrassing and interdiction targets and areas for our fire. The forward observer would often set up in the third floor of a farmhouse after dark and send back data to the command post for flash and sound plotting (triangulation) for counterbattery fire. The forward observer's communication with the battalion was always by radio because the enemy shelling usually cut the wire.

After about nine months of combat, operating with armor, infantry, cavalry, and engineers from Normandy through France to Luxembourg and into Bastogne, with Patton's Third Army, the 696th was assigned to the Ninth Army and crossed the Rhine River into Germany. With these facts in mind, I would like to relate a day of combat which is still vivid in my mind after 40 years.

My forward observer came back from a meeting with the captain and stated that we had been assigned to operate with a tank platoon — the infantryman would be riding the tanks and walking the flanks. We were to proceed down a road and take a small town about five miles away. This was good news, for we had operated with the platoon leader before and knew he was a good man with a good platoon. The Germans had retreated and left no rear guard; so this was to be a probing operation to find out where the enemy was and to reestablish contact.

The forward observer radioed back to the fire direction center, giving aiming points, such as crossroads and open fields, in case we met the enemy and needed artillery. As the column pulled onto the road, my forward observer tank was the third one in line, which was standing operating procedure. The infantry checked the woods on our flanks as we moved forward with no opposition; then the column stopped. The platoon leader ordered his tanks to deploy to the left and right at the edge of the woods in a field overlooking the south end of the town, which had about 50 houses and a church. There must have been an intersecting road going east and west, for the town's length was perpendicular

to our advance. There was approximately 1,000 yards between us and the town. All of the tank commanders checked the town with binoculars, and there was no sign of the enemy; worst of all, there was no sign of life. I surely wished we were back with Patton's Third Army and assigned to the 4th or 6th Armored Division. I knew that Patton would have flattened the town. Even though we were assigned to an American armored division, we were in Field Marshall Montgomery's Ninth Army; and he moved slower and was more deliberate, firing only when engaging the enemy. I glanced at the driver who shook his head and frowned. The forward observer alerted the fire direction center that we were about to approach the town. We all shared the feeling that this place was perfect for a rear guard to halt and attack — in other words, an ambush.

The platoon leader gave the order to move out, and when we were about halfway to town we started receiving artillery fire. The infantry dismounted the tanks as the forward observer ordered one round of smoke. Making one adjustment, he requested battalion two rounds of smoke to cover our advance. Then he requested battalion two rounds of high-explosive fire-for-effect as we continued moving forward, firing from the tanks. My tank knocked out the church steeple since we knew it was a favorite place for German forward observers. As we got closer to the town, our forward observer lifted the fire on the south side of town and ordered fire on the north side. A couple of our tanks were knocked out by 88s that turned out to be two German Panther tanks, one on the east end of town and the other on the west. We knocked out the German tank on the west as we got to the rear of the houses on the south side, but we were still receiving enemy artillery and small arms fire. The forward observer told me to get a walkie-talkie radio and join him outside the tank. We went to the third floor of a house, where he went to a window and began sending fire missions. Between rounds, we fired our carbines at German infantry on the other side of the street. The forward observer called for artillery fire to fall behind the houses on the north side of the street along the entire length of the town; I kept hoping we would not have any short rounds.

The platoon leader's tank knocked out the remaining German tank as it attempted to skirt our flank on the east side of town. We had only three tanks left and could not advance or retreat, and so the platoon leader requested ambulances

and reinforcements. Five ambulances were sent up, and the wounded were loaded. Three of the ambulances were knocked out by enemy artillery while returning on the road we had used to enter the town. Enemy artillery increased, and German infantry attempted to cross the road. The forward observer saw German soldiers coming from the woods to the north and called for battalion fires on the counterattack. He was right on target and kept moving the artillery fire up until it was falling in the backyards across the street from our position. We were lucky the Germans did not have any tanks left.

The forward observer's calls for fire on the German reinforcements and their counterattack had held them in check. Word came that our reinforcements were coming up the road and across the field. The Germans started to withdraw, and our infantry attacked the other side of the street and took 35 prisoners. The forward observer and I went downstairs to our tank. The battle was over.

It has been a long time since I have worn my Army uniform with the crossed cannons on it and the red braid on my hat; but, like you, I will always be an artilleryman. The field artillery *was, is, and always will be* the King of Battle.

John J. McMahon
McLoud, OK

More on rearming and refueling

I read with great interest Captain John House's article "Rearming and Refueling" in the July-August 1983 *FA Journal*. Amen to the lack of radios authorized to the battalion trains! A solution used by my unit in Germany was to obtain permission to retain the battalion fire direction center M577 which became excess after we converted to TACFIRE, and to hand-receipt two additional radios from other units on our post. These actions provided a real center to control the many diverse functions of the trains and did not require the reduction of the battalion supply section's hauling capacity by building up a 2 1/2-ton or 5-ton truck.

The two radios were extremely useful. One radio stayed on the battalion command (voice) net to monitor battery locations and general tactical information. The other radio was used as the net control station for a battalion admin/log net, which the batteries used to request resupplies through preformatted messages and which the logistics control element

used to control and coordinate its elements. Permanent subscribers on the admin/log net (except when the trains moved) were the service battery commander, personnel administration center, ammunition officer, maintenance technician/motor officer, the recovery vehicle crew, and the battalion executive officer (with his unauthorized radio mounted in his unauthorized vehicle — another MTOE *faux pas*).

I applaud Captain House's description and use of the refuel and rearm point; my unit and many others also used this technique at Grafenwoehr. Based on our experiences during REFORGER and our perceptions of war in Europe, however, the luxury of using this technique was, by far and away, the exception rather than the rule. Keeping up with our supported brigade required frequent movements on short notice. Therefore, resupplies of ammo were normally delivered to the battery when requested. Batteries were refueled either at night in position (the norm) or en route to new positions (under the direct control of either the service battery commander or first sergeant with a radio vehicle). The need for very close coordination in this operation reinforces the need for additional radios.

Allan M. Resnick
MAJ, FA
Fort Leavenworth, KS

EMP — the silent enemy

A single nuclear warhead detonated 250 miles or more over the central United States would blanket the country in an intense electromagnetic pulse (EMP) which, as a minimum, would damage and most likely destroy the communications network that the President and top military commanders depend on for the command and control of US forces. The current US command, control, and communication (C³) systems are vulnerable to the effects of EMP, and this nation's ability to launch a retaliatory strike is seriously jeopardized. Hardening of the US military's C³ systems against the effects of EMP must be the number one priority of all the US Defense programs. To establish this point it will be necessary to present the effects of electromagnetic pulse, its impact on unprotected electronic equipment and C³ systems, and the vulnerability of these systems. (The data I use in this analysis are based on material extracted from various unclassified military and commercial periodicals and on my

experience gained while working on the "Army Battlefield Nuclear Mission Area Analysis.")

The effects of EMP on C³ systems and electronics have been known for two decades. In July 1962 an atomic test off the Johnson Atoll, a speck of land in the Pacific Ocean 800 miles southwest of Hawaii, produced a plague of problems with electrical circuits in Oahu and Honolulu. Streetlights blinked out, fuses blew, burglar alarms and power lines went dead. Honolulu headlines the next day attributed the breakdowns to a nuclear "shock wave." The mysterious agent was EMP — an electromagnetic pulse of short duration produced by the interaction of nuclear radiation with the atmosphere. EMP is critical because of its unique properties and effects. It does not affect people, just equipment and, in particular, C³ equipment and electrical and electronic systems. It has a large "killing" range and is capable of causing disruption or damage to electronics from a burst at distances where other weapons effects cease to pose a threat as damage mechanisms. Most importantly, the military's increasing dependency on modern C³ systems enhances the EMP threat proportionally.

EMP affects all C³ systems in the same manner. Its energy is absorbed by materials with good electrical conduction properties; e.g., cables, antennas, wires, transistors, and silicon chips. This absorption is known as "coupling." The coupling of EMP with materiel induces voltages and current surges in the materiel and any component, device, or system which may be connected to it. Unshielded equipment showered with peak voltages and current surges from a nuclear blast experience electrical failures and simply cease to function at their design capability. Physicists who studied the impact of EMP on military equipment after the Hawaiian atomic tests were not concerned with EMP because the C³ and electronics systems in the early sixties used vacuum tubes. Vacuum tubes have thick metal parts, separated by a vacuum, which can withstand the high-voltage surges and continue to operate. As technology advanced, civilian and military designers steadily moved toward the more energy-efficient, compact, cheap, and reliable solid-state devices. In the early seventies, military engineers discovered that these solid-state devices, which predominately use silicon circuits, are a billion times more susceptible to the effects of EMP than devices with vacuum tubes. Even though the advanced technology used in the design and construction of our present C³ systems gives us certain advantages in a conventional conflict, it increases our susceptibility to defeat in a nuclear

environment.

The vulnerability of our C³ systems appears to fall into three broad, deficient areas: hardened systems, redundancy, and mobility. The present communication satellites, which the Pentagon depends on to deliver over 70 percent of the military messages, are not EMP hardened. Only one of the four Presidential airborne command posts has been hardened against EMP. All transmissions from the early warning satellites (assuming the transmissions get through) must pass through two central command center ground stations — one at Sunnyvale, California, the other at Woomera, Australia. These fixed stations create lucrative nuclear targets and provide little or no backup capability in the event they are destroyed. In light of the increased accuracy of today's ballistic missiles, even hardened command centers may not prove survivable. It is for this reason that consideration is being given to placing early warning receiver stations in trucks and augmenting the capability of the KC-35 command and control aircraft with 18-wheel vans capable of relaying messages to all critical points in the defense communication network.

Regardless of how sophisticated our present C³ systems are, it is evident that the far-reaching effects of EMP pose an ominous threat to the survival of these systems in a nuclear conflict. The problem is not one which is limited to a particular slice of the battlefield, but one which ranges from the Office of the President of the United States to the lowest platoon leader on the battlefield. The destruction of early warning satellites and radars, communication satellites, and ground control communication centers resulting from a strategic nuclear burst would throw the armed forces in disarray and set off coast-to-coast pandemonium. The ability of the President to transmit his orders for a retaliatory strike and the ability of military commanders to execute his orders would be difficult at best. Tactical nuclear warheads detonated near tactical command posts on the battlefield could destroy the C³ systems of the unit and leave its personnel and weapons systems virtually intact. Unit commanders who had depended on C³ systems to transmit critical tactical decisions to influence the battle would be reduced to the use of messengers and nonelectronic means to conduct the battle. The Pentagon readily admits it has been late recognizing the vulnerability of C³ systems to EMP; however, much has been done to reduce the vulnerability to EMP and strengthen the survivability of these

systems. Over the next five years, the Reagan Administration plans to spend \$20 billion to make the C³ systems more survivable and less vulnerable to the EMP effects generated by a nuclear blast. Cost-conscious congressional leaders seeking to cut big military defense spending programs would be ill advised to pursue cuts in any programs dedicated to improved C³ systems. All Pentagon efforts to upgrade C³ systems must receive the highest priority. Failure to do so will render the current command and control network defenseless in its most critical time of need.

Jerry Harper
MAJ, FA
Fort Monroe, VA

More on "Pass Guidons, Not Paychecks"

Having just finished reading Captain Harrington's article on the change-of-command inventory ("Pass Guidons, Not Paychecks," November-December 1983 *Journal*), I would like to add two observations.

- While Captain Harrington placed the emphasis of his article on MTOE/TDA end item property and components, the more difficult aspect of the inventory deals with installation property, especially the accurate identification of each item. What is the difference between an end table, a nightstand, a telephone table, and a vanity, for example? Just as Captain Harrington advocates a thorough review of the MTOE/TDA prior to the inventory, so must the incoming commander thoroughly review CTA 50-909 for each line item on his installation property hand receipt to get a complete verbal description of the majority of his property. Once again, GSA catalogs provide descriptions and line drawings, particularly for office-type furnishings. Also, the quartermaster furniture warehouse and the family housing office may be able to provide a picture book for aid in identifying quarters-type furniture. Together, these documents will greatly assist a commander in conducting a very important aspect of his inventory.

- My other observation is that any commander who intends to depart command with his wallet no lighter for the command experience must fully involve himself in his supply room's day-to-day operations. He should allow his supply NCO and officer to advise him on supply policy formulation, and he must give them the latitude necessary

to implement his final policy; but he cannot afford, from either a readiness or financial perspective, to lose touch with his supply operation. A commander *must* conduct the cyclical inventories (i.e., 10 percent of total line items per month). He *must* conduct his post-exercise sampling inventories during his recovery periods. He *must* foster a command environment which demands and enforces supply discipline all the way down to the user level. Finally, he *cannot* be a stranger in his own supply room. Supply, as with any other section, needs periodic inspection and, if necessary, higher-level assistance visits to ensure smooth operation. Without such measures, a battery commander may find himself acting the role of the fictitious "Captain Smith" in Captain Harrington's introductory scenario.

Scott E. Tillson
CPT, FA
Erie, PA

Manual to computerized

In general, Lieutenant Colonel Robert Helms' article "One on One with 3x6" is a fine lessons-learned paper addressing the 3x8 concept in a 3x6 configuration. However, it only addresses the manual gunnery approach and does not consider any automated systems. The Field Artillery is in a transitional period, going from manual to a totally computerized system. The technological advantages of the battery computer system (BCS), the backup computer systems (BUCS), and muzzle velocity management require incisive futuristic thinking. In that spirit, then, I offer these comments.

Early in the article Lieutenant Colonel Helms addresses two disadvantages encountered by the prototype 3x6 battalion: command and control became more difficult, and more complex fire direction procedures were required to mass fires. While the massing of fires becomes more complex in a manual/FADAC fire direction center (FDC), the complexity becomes virtually nonexistent in a battery computer system environment. With BCS, data is determined based on weapon location and aimpoint location for every mission. As the backup computer system becomes available, it will also have the same capability for a 3x8 configuration.

Lieutenant Colonel Helms is correct in suggesting that a second FDC be trained to assist in the computation of data and in facilitating the operation of the firing battery. The suggestion to use a hand-held calculator and chart or the Rizza fan (now known as the GFT fan) is a viable alternative until BUCS

becomes available. Once BUCS is fielded it will replace the FADAC and hand-held calculator on a one-to-one basis.

Lieutenant Colonel Helms discusses the increased tactical flexibility gained with the six firing elements in the 3x6 and 3x8 battalions. Although this is true, he seems not to recognize that these elements are only platoons and therefore cannot be expected to deliver the same effects on a target as an entire battery. The calls for fire will still have to be processed by one fire direction center, and coordination must be made as to whether the entire battery or a single platoon will engage a target. In most cases, a platoon of three howitzers will be ineffective against targets. Coordination must therefore be made between the two FDCs, and only one FDC should issue the fire order to engage any target. This is not to say that both fire direction centers should not be able to process missions independently, but a decision must be made as to the functions and responsibilities of each FDC and which one will have primary control. He also suggests that both FDCs will follow each mission, thereby allowing for transfer of mission and massing of platoons. With BCS and BUCS, this hand-off would not be required unless the primary FDC becomes non-operational. The data must be passed using a wire or radio link between FDCs and optimally between the FDCs and both weapon platoons.

In reference to weapon positioning, Lieutenant Colonel Helms suggests that the platoons be positioned perpendicular to the azimuth of fire. For similar ranges to target, this is not of any significant importance; nor is the charge. It will, however, be important to make maximum use of the M-90 velocimeter so that current muzzle velocity data will be available for all charges.

Lieutenant Colonel Helms briefly mentions that the battery commander will have to bring survey into both positions. It is true that in order to transfer GFT settings, common directional and horizontal control must exist in the two positions to effectively use registration corrections. This survey can be established using hasty survey techniques.

Finally, Lieutenant Colonel Helms observes that common direction can be brought in by simultaneous observations and the Polaris II method. This is an important point, but in the next paragraph he addresses laying the platoons on different azimuths of fire. There is no need or reason for doing this. With automated procedures and with one platoon as a backup for the other, the

same azimuth of lay is imperative because this option is not available with the battery computer system.

James S. Wojczynski
LTC, FA
Fort Sill, OK

Hasty surveys with the TI-59

The September-October 1983 issue of the *Field Artillery Journal* contained a letter to the editor regarding the use of the TI-59 calculator for hasty survey ("Performing hasty surveys with the TI-59"). Although certainly an accurate method, it appears formidable and time-consuming. Therefore, I propose the following method which, I believe, is somewhat more field-expedient and just as accurate as the published method. The requirements for the proposed technique are a known direction, a means of accurately determining distance (the M16 subtense method or the use of premeasured wire, for example), and the TI-59 with the gunnery chip. The procedure is as follows:

2ND, PGM,05,A
2ND, PGM, 02
Survey easting, enter, battery easting, enter, target easting
Survey northing, enter, battery northing, enter, target northing.
Survey altitude, enter, battery altitude, enter, target altitude
Azimuth to flank station, enter, azimuth of lay, enter, observer-target direction
Distance to flank station, enter, RG
Vertical angle, enter, VA (the calculator will display vertical interval)
B
RCL 10 (the calculator will display the flank station easting)
RCL 11 (the calculator will display the flank station northing)
RCL 13 (the calculator will display the flank station altitude)

Note: If there is a requirement to use more than one flank station, one should transfer the known direction to the flank station and repeat the steps above with the flank station's easting, northing, and altitude used as the survey data.

Michael J. Jaye
ILT, FA
Schofield Barracks, HI

Subject matter experts within the Gunnery Department find your procedure to be a technically correct field expedient for simplifying hasty survey in cannon gunnery application. — Ed.

TI-59 in high-burst/mean-point-of-impact registration

In my battery fire direction center, I have found the TI-59 calculator extremely useful in a vast number of gunnery applications and have used its valuable programs many times; its use does not stop at just checking ranges and deflections with chart data.

Very recently, while conducting training on manual and TI-59 calculations of high-burst registrations, I encountered a problem. When trying to determine the azimuth and distance from 01 to 02, the two individuals who were computing the high burst manually were coming up with large errors. One of the men asked me if the information could be recalled from the TI-59. When I looked at the TI-59 reference note, I could not find a data recall register, and there is not one listed on the operator's memory map on page 7b of the reference note. After running the program, I discovered that the calculator does actually store the information in data registers. There are four data registers that pertain to the high-burst/mean-point-of-impact program that are not listed:

Data register	Contents
52	Distance 01 to 02
53	Azimuth 01 to 02
54	Azimuth 02 to 01
61	Distance 01 to high-burst/mean-point-of-impact

Once the high-burst/mean-point-of-impact program is recalled (2ND PGM 04) and the routine is set up (2ND E), the grids for the two observers are entered. After this action is completed, the observers are oriented (press A, ADV, ADV, ADV). After the orienting data for the observers are known, you can then find and display the distance from 01 to 02 by pressing the RCL and typing 52. To find and display the azimuth from 01 to 02, just recall data register 53. To find and display the azimuth from 02 to 01, recall data register 54. After you have entered the azimuths from the observers and the vertical angles for the number of usable rounds (usually six rounds), the mean-burst location can be determined by pressing the number of usable rounds fired and C. Having completed this action, you can find the distance from 01 to the high-burst/mean-point-of-impact by recalling data register 61 — the distance will appear for use when using the polar plot method for location.

I have found this procedure

extremely advantageous in checking manual computations of the high-burst/mean-point-of-impact registrations. Since survey data is not always readily available, the process is an important check in conducting this type of registration with the TI-59 calculator.

Donald A. Yamilkoski
SGT, FA
APO NY

Qualified artillerymen

Having spent three years in the 59th Ordnance Brigade, serving in two separate detachments and on one group staff, I wholeheartedly endorse Major Jerry Morelock's thoughts in his letter entitled "Nuclear Weapons Technical Inspections" (March-April 1984 *Field Artillery Journal*). He accurately identified and discussed many of the most critical issues facing the 59th Ordnance Brigade and the artillery as a whole, the most important of those being the heavy reliance upon statistics as indicators of readiness. While General Trefrey accurately describes the Army policy regarding the interpretation of inspection results, Major Morelock highlights the reality of the situation by illustrating that nuclear weapons technical inspection (NWTI) results are used as a major portion of the final grade card a unit receives. This one-dimensional approach for evaluating the readiness of a unit is extremely detrimental and must be changed.

I feel that several other problem areas must be addressed. In order for an artillery officer to be considered fully branch-qualified, he must have successfully commanded, have had adequate troop time, have completed the Officer Advanced Course, and should have had delivery system experience. The problem that exists here is the fact that time with a delivery system is unavailable in the 59th — a situation which adds to the already destructive "second-class artilleryman" perception prevalent among field artillery officers serving in the 59th. Such perceptions cannot help but detract from the effectiveness of the unit and the artillery as a whole.

Other problems which must be addressed are tied to the remote locations of many of the units themselves. For example, language proficiency by a greater percentage of personnel would help to alleviate a large number of the interoperability problems for units stationed in a foreign country. Methods of reducing the reliance upon numerical indicators and a swing toward realistic evaluation criteria would also help. Genuine concern for personnel assigned to these remote stations and changes within the

artillery's qualification criteria is absolutely essential to give credit to those who are, in fact, qualified artillerymen and to reduce the "second-class citizen" shadow that cannot help but negatively impact upon the overall readiness of the 59th Ordnance Brigade and the Army as a whole.

Kevin Jackson
CPT, FA
APO NY

More on combat-effective advance party vehicle

Sergeant First Class Noel Fox's concern in using the M548 as an advance party vehicle ("Combat-effective advance party vehicle needed," March-April 1984 *FA Journal*), is certainly valid. The Vietnam Conflict showed that the M548 was extremely vulnerable to nearly all types of fires and shrapnel. The issue of the M113 to SFC Fox's unit and other Reserve Components field artillery units would be a quick-fix for this problem, but is probably not feasible in the near future due to current Active Component table of organization and equipment requirements for the vehicle. Active Component field artillery units normally use the Gama Goat as the advance party vehicle, but it is also extremely vulnerable to enemy fire.

Future developments will remedy the current situation to a great extent. The M992 field artillery ammunition support vehicle (FAASV) will be fielded in Europe in May 1985. It will replace the M548 on a one-for-one basis in M109 units. Fielding of this vehicle is, however, currently scheduled for USAREUR units only. The FAASV offers the same ballistic protection as the M109 and incorporates an NBC ventilated face piece system as well as an automatic fire suppression system. It is armed with a .50-caliber machine-gun. Additionally, another system under consideration for battery defense is the M113A2, armed with a 25-mm gun which would be significantly more effective than the current .50-caliber machinegun. This concept could possibly materialize as a result of the replacement of the M113 in maneuver units by the Bradley fighting vehicle (FY88-89). The current requirements for advance parties should be greatly diminished due to the 155-mm howitzer extended life program (HELP) and the howitzer improvement program (HIP). These howitzers will have onboard position and direction locating equipment which will automatically provide position location and direction data, thus providing a self-laying capability.

The above innovations will allow a howitzer section to operate in a semiautonomous mode.

Taft M. Joseph, Jr.
DAC
Fort Sill, OK

FIST deficiencies

A recent report from the National Training Center (NTC) reveals several fire support team (FIST) deficiencies, some of which can be traced back to training deficiencies at the Field Artillery School.

There exists the erroneous perception that *all* the deficiencies in FIST performance may be the result of insufficient or inappropriate training provided to lieutenants in the Field Artillery Officer Basic Course. The 17 weeks and 3 days of training offered to newly commissioned lieutenants provides them with a functional capability in a variety of field artillery battery-level positions. The Basic Course program of instruction is carefully balanced to ensure that its graduates are reasonably proficient as battery executive officers, fire direction officers, and fire support team chiefs. They are given a fair amount of instructions regarding leadership, maintenance, and administration. Which of these skills the lieutenant will develop depends largely on the position to which he is assigned. The degree to which these skills are translated into high proficiency and effectiveness depends in large part on the sustainment and reinforcement training he receives, the experience he is allowed to assimilate in his unit, and the involvement and interest of his commanders. New lieutenants are not, never have been, and should not now be expected to be totally prepared to assume TOE positions the instant they report for duty, based solely on their school training. Such expectations are unrealistic, impractical, and dangerously idealistic.

A brief review of fire support and FIST-related subjects taught in the Basic Course program of instruction will help to reveal exactly what the Basic Course graduate will have under his belt before he reaches his first assignment.

Gunnery

The problems in gunnery instruction appear to be minimal; Basic Course graduates are capable of calling for and adjusting the fires of all available fire support means, to include field artillery, mortars, air, and naval gunfire. The obvious means of improving shooter competence would be to increase the number of live-fire shoots and the amount of time the student spends on the Training

Set, Fire Observation.

Target acquisition

Many assume that Basic Course students are adequately trained in basic map-reading skills. Cross-country navigation is one thing; but unique field artillery map-reading proficiency, to include terrain association, is quite another. Thus, map reading may well be one area in which added or improved instruction, both classroom and practical (field), may be appropriate. The ability to locate oneself on the map within 10 meters of actual ground location is absolutely essential to accurate target location. What good is a laser rangefinder that gives the distance to a target, accurate to within 10 meters (for polar plot or shift from a known point), if the observer is located in a different grid square than he thinks he is?

Tactics

The tactics portion of the Basic Course program consists of 295 hours of instruction (183 of them in the Seven-Day War), during which the future FIST chief learns fire support techniques, maneuver tactics, and fire support planning and request procedures. One possible problem area in the tactics program of instruction is the vagueness of performance standards. During the actual instruction, the student may well be given specific standards to achieve; but the program of instruction does not show them. Examples are "in accordance with FM 6-20" and "in accordance with FM6-50."

Bringing it all together

Clearly, the most readily identifiable problem is bringing the parts together. Numerous FIST-related subjects are taught, but little FIST training *per se* is provided. Thus, the Basic Course graduate knows observed fire, is familiar with tactics and techniques for fire support, is capable of operating various instruments (the battery computer system, digital message device, and TI-59 hand-held calculator), but is unable to bring together these parts into the whole — FIST competence. He participates in a seven-day field exercise that stresses firing battery operations but should emphasize company-level fire planning and fire support coordination. He begins to appreciate the importance of the teamwork necessary within the fire support system; but he certainly is not fully prepared to assume the duties of a FIST chief. Only when he is assigned to a divisional direct support field artillery battalion will the lieutenant be required to apply his fire support proficiency in a real-world environment. This same lieutenant will not be fully competent to function as a FIST chief until he receives

further training in his TOE unit of assignment, learns the unique standing operating procedures of that unit, forms a "habitual association" with the maneuver unit, and is given further guidance by maneuver and field artillery commanders and his own battalion and brigade fire support officers.

It is not clear how all these problems can be resolved in a school environment where individual proficiency is taught and tested; however, by initiating a program of FIST-intensive training, suitably reinforced with practical work and extensive field exercises, preferably with TOE-type FIST personnel from divisional units, the most glaring deficiencies could be removed. Such training would coalesce the already well-taught individual tasks into the systemic competence needed for effective FIST performance. Some suggested solutions are:

- Train map-reading skills to higher levels of proficiency, particularly in terrain association and self- and target-location.
- Increase the number and quality of observed fire shoots, to include the "walking shoot" technique.
- Use some of the time available in the tactics portion of instruction for field exercises which coalesce individual skills into the full FIST proficiency necessary. Provide a "crosswalk" wherein the Tactics and Combined Arms and Gunnery Departments cooperate in the instructional setting.
- Emphasize to the future FIST chief, more strongly than ever, that he is in fact a company-level fire support officer — the fire support coordinator for the supported maneuver company/team. Make sure he knows he must seek and nourish habitual association with his maneuver company/team.

Conclusion

The FIST concept is still relatively new and needs improvements and refinements in approaches to training as well as in overall tactics and techniques. Our current Basic Course graduates are bright, ambitious, and well-motivated young officers who would welcome any effort made by the School to make them even more proficient and therefore more effective as fire support team chiefs. It is up to the Field Artillery School to provide this training, initiative, and leadership — we owe it to them and to ourselves.

Charles E. Mehring
MAJ (Ret), FA
Lawton, OK



ONE UP ON 1a

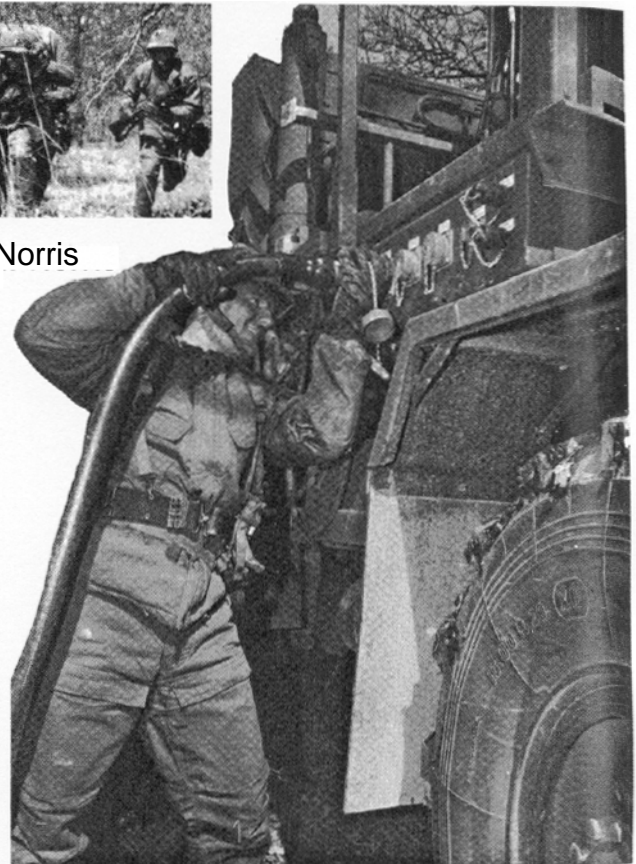


by Captain Robert Sankner and Captain Peter H. Norris

You don't need to sell Pershing II (PII) to a firing platoon leader. One day in the field is enough to convince the skeptic that II is better than 1a. The proof all starts with a familiar sound.

AAOOOGAH!

It's like the old World War II submarine movies when the captain yells "dive, dive"! The klaxon activates each Redleg's adrenaline as a screamed command pierces the platoon control central. "Fire mission! Initiate quick counts on all three rounds!" The switch from relative calm to a hotbed of activity is quick. The operations personnel decode and authenticate a message sent from the highest command center in Europe which gives the Pershing firing platoon leader, a field artillery captain, the authority to fire. The count crews start countdown operations on three Pershing II missiles as the fire control officer monitors all three counts. Within just eight minutes, the 300 by 150 meter firing position deep in the woods fills with fire, smoke, and a deafening roar that rattles the bones as the three Pershing II missiles lift off within seconds of each other and fly 1,000 miles downrange to deliver their nuclear calling cards with devastating accuracy. With



Pershing 1a, the platoon leader would still be waiting to fire his first missile and would have to wait another 20 minutes after that to fire sequentially the remaining two missiles. The smoke from the first round would surely lead the enemy special operations units directly to the position.

Too few Redlegs know about either the old or the new Pershing. The weapon system seems shrouded in mystery, which is a real shame since a Pershing firing platoon faces challenges every bit as real and demanding as those facing a howitzer battery. So here is a subtle sales pitch from the initiated to the uninitiated. Take part in a PII mission.

The alert call comes to the firing platoon leader at 0330 one day: "Report to the battery ASAP." But there is no need to worry. Preparations for this sort of call are a part of every day's training. The three firing platoon leaders have done their homework. Load plans have already been fine-tuned. Their soldiers know what they must do — load up to go to the woods indefinitely. Do not plan on coming back; do not leave anything behind; and be sure to top off the fuel pods with diesel and MOGAS. When the platoon leaders arrive at the battery area, their soldiers are handling the loading tasks efficiently. Their noncommissioned officers and enlisted personnel are a motivated group.

A platoon sergeant, an E7, checks with the battery support platoon leader, a second lieutenant, to see what can be done to get the stubborn 2 1/2-ton trucks cranked in the cold of the morning. The lieutenant explains that the support platoon personnel attached to the firing platoon for the field will be finished loading their portion of the battery's packaged POL products and will arrive shortly to help.

There is nothing left for the platoon leaders to do but check with the operations officer, another captain. Each one goes to the safe and gets the classified strip maps to his platoon's first position and makes sure that the operations personnel pick up all of the code books and assorted top secret targeting documents. These allow the platoon to respond to the Supreme Allied Commander, Europe and the US Commander-in-Chief, Europe without going through any middlemen.

The platoon leader already knows what targets he is assigned. Pershing missiles are assigned pre-selected targets designated by the theater commander. Each platoon leader has the target data for his missiles already stored on target cartridges ready for insertion into the Ground Integrated Electronics Unit on the side of the erector launcher. From the Ground Integrated Electronics Unit the recorded target data is transferred to the on-board computer in the missile, where it will be used in a later comparison with the live radar scan from the reentry vehicle. The tape cartridges come from the Reference Scene Generation Facility located at battalion headquarters. To produce target reference scenes, the Reference Scene Generation Facility uses information extracted from a target list and an operational data base. The operational data base contains digitized elevation and topographic feature data stored on discs. These discs are produced by the Defense Mapping Agency and distributed to all Pershing II units. The battalion targeting section, headed by the targeting officer, controls and distributes the cartridges as they are produced. Target cartridges are classified either secret or top secret, depending on how many targets are contained on them.



At this point, all the platoon leader is waiting for is the go-ahead to shoot, which comes down from higher headquarters in a coded message. This message traffic is remoted to the platoon control central van via the AN/TRC-133 single side-band radio set. Five single side-band nets are monitored continuously and create a background noise which is always present in the control center. There are also two AN/VRC-46 radios with Vinson secure gear; and, as if all of that is not enough, there is an AN/MSC-64 tactical satellite system which is also remoted to the platoon control central. The platoon leader *will* be able to receive that release message when it comes down.

The battery executive officer, a senior captain, returns from the battalion operations center where he has received last-minute instructions from the S3 and has picked up copies of the operations order. He has also coordinated the receipt of repaired and calibrated equipment from the direct support maintenance company located with the battalion. He briefs the battery commander, a major, on the operational plan. The battery commander reviews the unit manning roster with the first sergeant and then gathers the firing platoon leaders for a briefing.

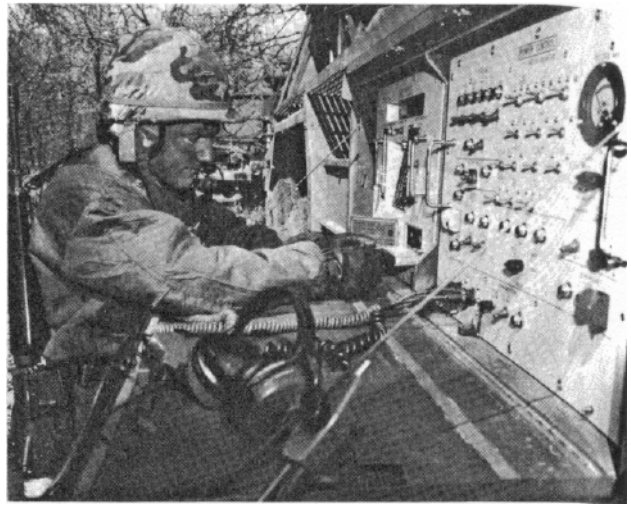
Two platoon leaders are told they will be light, and one is told he will have the heavy platoon. The two captains like being light since they are then on their own, each with a slice of the battery support sections. For communications each has an E5, an E4, and two E3 05Bs to operate the AN/TRC-133 single side-band rig; an E5 and an E4 26Q to operate the AN/MSC-64 tactical satellite rig; and an E4 and an E3 36K to lay wire. In the operations section the platoon leader has his fire control officer, a lieutenant, along with an E6 15E operations NCO, an E5 15E operations assistant, an E5 21G platoon control central operator, and an E4 21G platoon control central operator. For his mess section, the platoon leader picks up a mess trailer and two cooks who will prepare the platoon's rations at the platoon position. The battery motor pool supplies six



mechanics and a recovery vehicle to assist his assigned missile maintenance warrant officer. One medic brings the total number of personnel at the light position to 64. With these 64 soldiers, the light platoon leader must man his own perimeter defense — no small task when one considers the significant number of enemy soldiers looking specifically for Pershing.

The heavy platoon sets up with the rest of the battery headquarters, including the motor pool, the forward area support team from the forward support company, and the missile maintenance section. The battery's three platoons will be separated by several kilometers.

The firing platoon sergeants and platoon leaders have already gone with the battery operations officer a few weeks earlier to look at the areas in which they are going to deploy. They are good areas, deep in the woods with good overhead cover. The trees are evergreens, and the areas can be occupied during winter as well as summer. A solid road network winds its way through each of the areas, thereby allowing the emplacement of erector launchers on firm ground. Many of the road networks in the German forests are easily traveled because the Germans use much of the area for logging operations. Most of the trails are well-worn and either have been recently covered with gravel or have been hardened at one time. Not all roads, however, will be able to accommodate Pershing II. Some of the roads may be dirt or mud depending on weather conditions. A good reconnaissance eliminates any areas that may pose significant problems to the platoon leader. At 82,000 pounds per erector launcher with missile and prime mover, it pays to stay on solid ground.



This Pershing II system has eliminated major headaches that confronted the Pershing 1a platoon leader. The PII is a real blessing for a platoon leader in the field and for the troops as well. The platoon leader no longer has a target azimuth limitation as is the case with P1a. Therefore, he no longer must jockey erector launchers between trees. All he needs is a 10-foot hole in the overhead cover through which to fire the missile. Ground support equipment used with Pershing 1a is eliminated. The programmer test station, critical to P1a launch operations, is no longer required. The computer components needed for the launch of PII missiles are located right on the erector launcher. The sequential launch adapter, which allowed P1a to switch countdown operations from one missile to the next with the flip of a switch, is gone for good. With Pershing II, all three rounds can go through a countdown simultaneously. There is no power station with its jet turbine engine and its significant heat signature which is so easily detected by enemy infrared photography. Now there is a 30-kilowatt generator mounted on the prime mover with all the power needed to condition, count, and launch the missile. The prime mover also has its own crane for mating or demating the missile, thereby improving response time, reliability, and survivability.

Cables were another problem with Pershing 1a. Pershing 1a platoon positions looked as if someone had dumped a bowl of black spaghetti on the areas. Each of the three platoon missiles had a 1,200-pound cable bundle, a high-pressure air hose which distributed 3,000 pounds per square inch of high pressure air, and a conditioned air duct which allowed hot or cold air to pass to the missile — plus an array of grounding cables and several essential cables going to the platoon control central. Needless to say, the manual labor required of the soldiers in the mud, snow, and rain was significant. With the new system, there are only two cables (not counting the grounding cables) associated with each missile. There is one power cable and one cable from the launcher to the platoon control central. The soldier quickly learns to appreciate Pershing II!

This Pershing II battery deploys to hide positions to increase its survivability. It is not tasked to come up immediately into a quick reaction alert status on its missiles — one platoon leader is to keep one missile

and the platoon control central available for a fire mission. By checking maps provided by the engineers to illustrate all bridge weight classifications in the unit's area of operation, the platoon leader has already determined that the route of march he planned to use will support the 41-ton weight of the missile and prime mover.

The executive officer tells the firing platoon leader that the battalion ammunition platoon, commanded by a lieutenant, is conducting a ground nuclear convoy to a location near the firing platoon's first position. The firing platoon leader picks up his warheads from the ammunition platoon before he pulls into his position.

The platoon leader sends out an advance party (this time under control of the platoon sergeant) to prepare the position for occupation. The advance party consists of as few personnel as possible, but with the number of tasks to be performed it will usually include about 10 soldiers. Upon arrival at the firing position, the advance party makes a security sweep of the area, as well as a check for nuclear, biological, or chemical contamination. The advance party has many other tasks to perform: designate locations of vehicles and equipment, prepare a track plan of the area with a separate entrance and exit, designate a vehicle order of march for the main body, establish a hasty defensive perimeter, and lay wire to individual fighting positions. About 30 minutes after sending out his advance party, the platoon leader leads his platoon out of garrison.

The first few days in the hide position are quiet. The platoon pulls into position as tightly as possible, camouflages all equipment, sets up security, and minimizes electronic and infrared radiation. To minimize electronic signature, the platoon uses only FM radios, wire, and couriers for communications. An infantry squad provides early warning for each platoon position.


The platoon leader, under the direction of the battalion S3, moves his platoon twice to increase survivability before receiving the message directing his platoon to fire a single missile. To avoid giving away the position and causing the entire platoon to move again, the platoon leader chooses to take the missile, the platoon control central, and a small security force to an external firing point he had previously selected about five kilometers from his hide position. After successfully firing the missile, he takes the empty launcher to a resupply point a few kilometers from his hide position where the battalion ammunition platoon is waiting with a new missile — a first stage, a second stage, and a reentry vehicle with warhead. After mating the missile, the platoon leader and his soldiers return to the hide position.

Post-strike analysis filters down from brigade and indicates that the round was right on target. This accuracy comes as no surprise. The reentry vehicle is a terminally-guided projectile which compares live radar imagery with scenes stored in the on-board computer prior to launch. Any corrections required to the ballistic course are made by air vanes mounted on the reentry vehicle. The

improved accuracy has made possible the reduced warhead yields on the Pershing II.

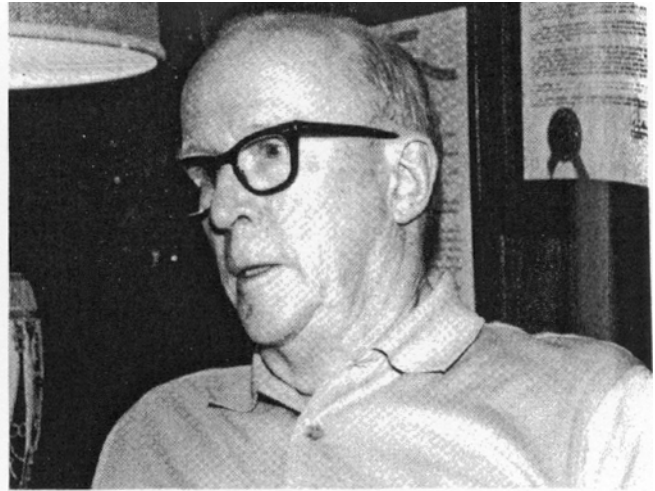
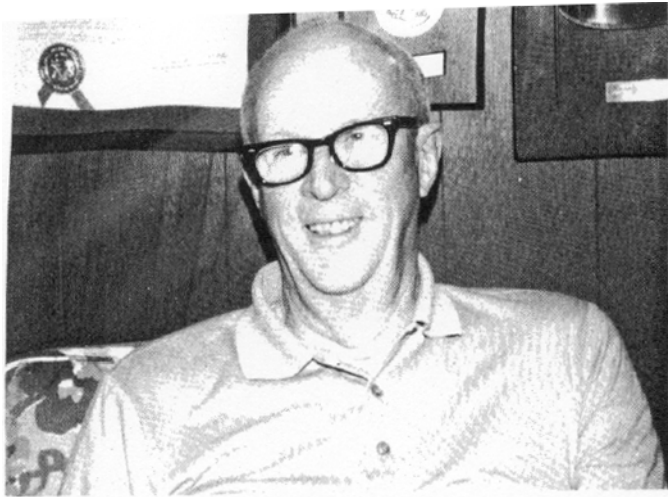
On the day after firing, while the platoon is en route to a new position, the battery operations officer in the battery control central instructs the platoon leader to employ in a silent firing platoon configuration. The platoon leader immediately reaches for a radio and tells the advance party to prepare the position accordingly. When the rest of the platoon arrives at the new position, the members of the advance party guide the vehicles into a firing position configuration. All ancillary vehicles are placed where the counting and launching of all three missiles are facilitated and where the blast created by the lift off of each round will not affect the other rounds. The vehicles will also provide protection to the missiles against direct observation and small arms fire. The platoon is ready to perform confidence counts on the missiles and assume target coverage when directed to do so by battalion. The purpose of a silent firing position is to provide increased survivability while allowing a shorter reaction time than that of a hide position. The firing crews emplace the missiles as they would in a firing position, but do not perform a countdown. The platoon control central and communications vans are set up, but are still using minimal communications assets.

A day and a half later the platoon receives instructions to assume target coverage and come up "hot" on all rounds and into a quick-reaction alert status on all targets. The count crews perform confidence counts on all three rounds — they enter the required data into the on-board computer, test all circuits within the system, and generally prepare the missiles for launch. Two rounds are counted without a hitch, but there is a minor problem with the third round; the platoon's missile maintenance warrant officer and the forward area support team sent from the heavy position quickly correct this problem.

By 1800 the platoon is eating the hot meal prepared by the mess section. After everyone finishes eating, the firing platoon leader gets his chow. As he takes his first bite, he hears it. AAOOGAH! The adrenaline pumps, and you don't need to sell Pershing II to this platoon leader. 

CPT Robert Sankner, FA, received his commission through the Officer Candidate School. He is a Field Artillery Officer Advanced Course and a Combined Arms and Services Staff School graduate who has served as a forward observer and fire direction officer in the 1-77th FA and as a firing platoon leader, battery operations officer, and battalion operations officer in the 1-41st FA, 56th Field Artillery brigade (Pershing). He was most recently a senior instructor in the Pershing Division of the Field Artillery School's Weapons Department. He now commands Headquarters and Service Battery, 3-9th FA (Pershing).

CPT Peter H. Norris, FA, received his commission through the ROTC at South Dakota State University. A Field Artillery officer, Advanced Course graduate, he is a senior instructor in the Pershing Division of the Weapons Department. He has served as a support platoon leader and firing platoon leader with the 1-81st FA, 56th Field Artillery Brigade (Pershing).



Dutch Treat

At his home in Alexandria, Virginia, General (Retired) Walter T. Kerwin, Jr., granted the editor of the *Field Artillery Journal* an interview in May. General "Dutch" Kerwin is the President of the US Field Artillery Association. During his illustrious military career, he served as the US Army Vice Chief of Staff; US Army Forces Commander; US Army Deputy Chief of Staff for Personnel; II Field Force Commander in Vietnam; Chief of Staff, Military Assistance Command Vietnam; Nuclear Planner for Supreme Headquarters Allied Powers Europe in Versailles, France; and Commander of the 3d Armored Division as well as the 3d Armored Division Artillery in Germany.

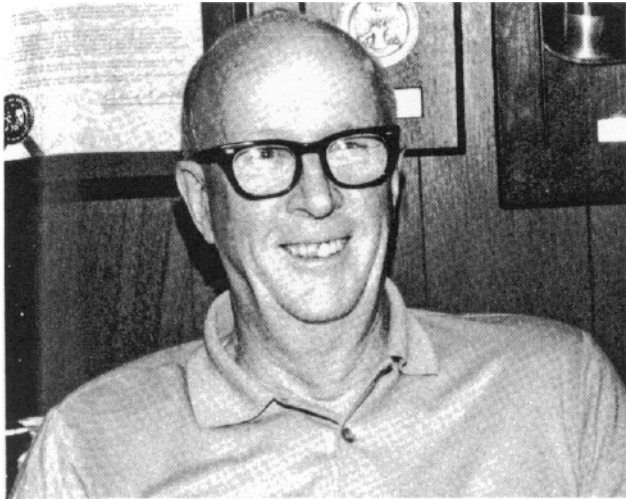
Journal: What are your most vivid recollections from each of the major conflicts in which you were a participant?

General Kerwin: I have several. One of the most vivid was my introduction to combat. In November 1942, as the S2 of the 3d Infantry Division Artillery, I landed at Fidela. The beach was half-moon-shaped, and French forces were at the tips. I started ashore from the command ship *Ancon* in an LCV with 34 other people. It was H plus 45 minutes, and the seas were quite rough. As we headed toward the beach we ran onto a reef about one hundred yards offshore and suddenly became a target. Everybody was huddling in the bottom of the LCV, and bullets were flying everywhere. We knew we had to get out of there. So everybody got on one side of the LCV and turned it over. Only 3 soldiers got ashore, and I was one. All the others drowned. I recall lying down on the sand and saying to myself, "If all combat is really like this, I've got a long war ahead of me." The landing at Fidela was really a minor action, but for a neophyte major of artillery it was major combat.

Another recollection I have is of the Anzio beachhead. The beachhead was extremely crowded. Units came ashore and had to go to a real estate board to obtain space. After we were ashore and were fairly well dug in, intelligence indicated that the enemy was going to counterattack. German divisions were moving down from Rome. One afternoon the corps commander, General Lucien Truscott,

who had been the previous commander of the 3d Infantry Division, called me into the corps command post. I was the 3d Infantry Division Artillery S3, a lieutenant colonel. The command post was located down in the catacombs under the town of Anzio. General Truscott said to me, "Here is what I want you to do. Visit every division on the beachhead to include all the separate battalions, review their fire plans, and, if you are not satisfied with them, tell the division commander to either change his fire plans or move his battalions. I am sending the corps artillery commander, a brigadier general, with you to see that this is done. If there are any problems, you tell the corps artillery commander, and he will call me." So there we were — the brigadier general and I — in a jeep at 4:00 in the afternoon racing around the Pontine Marshes. There were 28 to 30 battalions on the beachhead, and I reviewed all of their fire plans. I told them what I desired and, in some cases, moved them. It was well after dark before we finished. Some of the other divisions did not take too kindly to having their firing plans reviewed by the 3d Infantry Division Artillery S3. We arrived back about 2 a.m. The German attack came the next morning, and we were successful in stopping it. General Truscott himself described this incident in his book, *Command Decisions*.

Another vivid recollection was Tet in January 1968 in Vietnam. I was the chief of staff to General



Westmoreland, the commander of MACV. I was in my house in Saigon when the phone rang at just after midnight. I heard what I thought were firecrackers all over the place. I thought it was the celebration of Tet, but the operations center was calling to say that the North Vietnamese and Viet Cong had launched an attack. I got dressed, found my driver, went outside the house, got into the jeep, and started to drive to the operations center. Suddenly we came under fire. Bullets smashed through the windshield and through the engine. We crawled back to the house, and as we entered I heard the phone ringing. It was the operations center asking me why I was not there yet. I told them I would get there as soon as I could, but it was likely to be a long wait. I finally did get there after dawn and immediately got involved in directing a helicopter rescue mission to the US embassy.

Journal: *Do you think the role of the Field Artillery has changed since World War II?*

General Kerwin: Basically, there has been no change. The role remains to support ground gaining arms — the tankers and the infantrymen. The methods may change. At Anzio everything was barrages, close-in fire, and counterbattery; and we fired harassing and interdicting fires at night. All the fires were in fairly close. Now, of course, we have the AirLand Battle. The approach today is to get to the enemy with cannon, rockets, and other means before he gets to the immediate area. But the role of the artillery is still the same — to help the people on the frontline and keep the enemy off their backs. The ways and means vary according to changes in technology and the type of battle in which the artillery is involved. Our mission is still perfectly clear.

Journal: *Is there any single technological advance in the Field Artillery which you see as a quantum leap forward?*

General Kerwin: In my opinion, precision-guided munitions represent a quantum leap forward. If we are thinking in terms of a tank battle, volley after volley and concentration after concentration do relatively little to stop a tank attack. Direct hits are few and far between. Today, with Copperhead and similar rounds, we can have an 85 to 90 percent probability of kill with just one weapon. Now there are problems with precision-guided munitions —

specifically, command and control and communications are difficult. Nevertheless, I see precision-guided munitions as a quantum leap forward, and in the future we will probably see these in MLRS and other weapons coming down the road.

Journal: *Do you believe technology has become a more dominant factor on the battlefield than it has ever been before, or has its influence remained roughly the same over the last half century? How does it compare with leadership?*

General Kerwin: I noted your question says "more dominant." I would agree with the "more" because each antagonist today is trying to get a technological gain over the other. A major gain by one can have a significant influence. What I would like to stress, however, is that technology will not be *the* dominant factor. In my opinion the dominant factor on the battlefield is leadership. Sensitive leadership and discipline will be even more important in the future than they were when I was in combat and will continue to be increasingly more dominant. As we see the effects of DPICM and chemical munitions and (although I hope not) tactical nuclear weapons, we must realize that on this more deadly battlefield leadership is the dominant factor. I happen to be one of the few people today who has extensive experience with nuclear weapons tests — some of many megatons like the ones they exploded at Eniwetok and Bikini. In my opinion, not only is leadership extremely important, but we have not yet come face-to-face with the leadership problems we would face in a chemical and nuclear battlefield environment. That environment will call for a sensitive, disciplined leadership to a degree we have never needed before.

Journal: *Do you see greater potential for the Field Artillery of the future in cannons or in rockets?*

General Kerwin: Well, each one has its place on the battlefield. One of the most important factors in comparing them is their accuracy. At some time in the future we will probably have a guidance system for the rocket which will improve its accuracy greatly. So the potential for rockets is probably greater than that for cannon field artillery. On the other hand, we should never forget that there is a great problem of logistics with rockets. With the MLRS today, people are beginning to recognize the tremendous tonnage of munitions required to use that weapon effectively. Now one of the things that bothers me about rockets is their signature from firing. I mentioned that at Anzio things were so crowded that we had to have a real estate board. Nobody wanted an artillery unit located near them because of the signature. The artillery signature was obvious, and counterbattery fires were significant. Now Anzio may have been an unusual situation, but sometimes I think we all forget about the importance of signature. I recall that we learned never to put the met section near the division artillery headquarters — never less than a quarter-of-a-mile away even if it was in defilade. Once that met balloon went up, immediately there was enemy counterbattery or searching fire. Met people learned to do their job and get out quickly. In some cases, since the enemy had the dominant terrain, we did not even

use the met section because of its signature. With the MLRS the signature is great and will be an important factor in associating the MLRS unit with other division and corps units.

Journal: *Survivability considerations and technological advances are combining to push the Field Artillery into the development of semi-autonomous gun sections, and chiefs of section will have more responsibility than ever. Is this development changing the nature of what it has meant to be an NCO, or is it compatible with the NCO's traditional role?*

General Kerwin: Basically, to me the NCO still has the same role in our army he has always had. The discussion bounces back and forth, but it is really a question of degree. We tend to believe the role is changing only because over the past 30 years we have centralized more and more and taken away the responsibilities of the NCOs since leaders have tended to assume the responsibilities of their subordinates. Now I think that situation is changing. In any event, it must change given today's weapons — including the other side's weapons. There will be greater dispersion, higher intensity, and more night fighting; and so the NCO has to almost automatically be given back the responsibility. Our problem today is to ensure that he understands the responsibility, that we train him properly, and that we let him exercise the responsibility. Obviously, what I said not only applies to NCOs in field artillery units but to all NCOs in the army.

Journal: *There are ongoing investigations at the Field Artillery School on the concept of an artillery division to support the AirLand Force. Do you feel that this two-star position brings needed clout to the senior fire support coordinator for the Force?*

General Kerwin: There have been many discussions for years on artillery organizations and particularly whether the division artillery commander should be an O7 instead of an O6 or whether there should be an artillery division. I happen to be the last one-star division artillery commander in the 3d Armored Division Artillery in Germany in 1953 under General Creighton Abrams, the division commander. At that time I thought downgrading was a mistake because as a one-star the division artillery commander had an opportunity to work with brigade commanders and the corps artillery commander in an easier manner, particularly since the direct-support battalions lived with the brigades. I would be in favor of an artillery division in principle, but only if it directly resulted in *improved support* for the ground-gaining units and not just to get a two-star or separate organization. Here I emphasize that we field artillerymen must not lose sight of our role in supporting the infantrymen and tankers. This can happen if and when reorganization per se becomes the prime objective.

Journal: *As the Field Artillery modernizes its doctrine, equipment, and training to meet the anticipated threat, do you see any pitfalls which field artillerymen should avoid?*

General Kerwin: There are three things to keep in mind.

The first is the same thing I have just mentioned and is the most important — we cannot forget the basic role of the field artillery. Second, we must continually keep in mind the importance of leadership and the element of sensitive discipline as a part of that leadership on the battlefield. Thirdly, esprit and morale are keys and cornerstones in any outfit. I think we can all remember what esprit and morale did for the US hockey team when it beat the Soviet Olympic team four years ago.


Journal: *As President of the United States Field Artillery Association, why do you think Redleg senior noncommissioned officers and officers in the Active and Reserve Components should join?*

General Kerwin: Why join? First, I think it is for the same reason that all professional organizations and societies are formed. As a group we can focus more attention on our profession, exchange ideas, and keep up with the latest developments; and the United States Field Artillery Association affords us all an opportunity to do this. I am extremely pleased and impressed by the forward movement of the Association, and I am particularly impressed with the *Field Artillery Journal*, which is an excellent medium for passing on ideas. I think everyone who has an interest in the field artillery should be a member.

Journal: *Which leader, field artillery or otherwise, had the most significant impact on the style of leadership you chose to adopt and which was obviously so successful?*

General Kerwin: There were two leaders who impressed me most over the years. One was General Lucien Truscott, who was the commander of the 3d Infantry Division in V Corps and who later moved on to higher positions. The second was General Creighton Abrams, who was commander of the 3d Armored Division when I was the division artillery commander and who later went on to command V Corps in Germany and later MACV and who ultimately became chief of staff of the Army. These two individuals impressed me because they were the epitome of troop leaders. They were positive in their approach to problems, sensitive in disciplinary methods, and deep down had a way about them that instilled confidence. All you had to do was meet them for just a few moments to realize that each was a leader and that you would be most willing to fight under either one.

Journal: *What do you think is the biggest challenge facing Redlegs of the future, and what advice would you give to the leaders who must measure up to that challenge?*

General Kerwin: There are two challenges which stick in my mind as most important. The first is to keep up with the technological advances. There are a lot of them coming and at a very rapid rate. We must recognize them and seize upon them to improve the field artillery. The second challenge is to ensure that we do not forget that a well-trained, disciplined outfit can work wonders on a high-intensity battlefield. We have to train continuously to get that kind of an outfit; and, in a sense, this is more important than technology. 

WARRING WITH THE



WARRIORS

by Captain David W. Davis

The 2d Infantry Division Artillery came to Korea with the rest of the Indianhead Division in 1950 and fired its first round in support of the Pusan perimeter defense on 6 August. Thirty-three years later, the Indianhead cannoneers were participating in exercise Team Spirit '83; and these warriors were facing the same adverse weather conditions and rugged terrain as did their predecessors, for the exercise area included the site of one of the 2d Infantry Division's famous defensive battles, the battle for Chipyeong-ni.

This time, however, they faced not the Red Chinese, but rather the soldiers of the Orange Force, a corps-sized element made up of units of the US 25th Infantry Division and elements of a Republic of Korea Army (ROKA) corps. Before it was all over, some 41,000 US soldiers from outside Korea joined the 32,000 US soldiers in Korea and over 118,000 of their Korean counterparts in this United Nations Command/Combined Forces Command exercise in combined/joint operations. What follows is a division artillery perspective on the operation and the lessons learned.

The battlefield

The battlefield posed the same challenges experienced by field artillerymen during the Korean War. The terrain was rugged and mountainous, with narrow, winding roads running through valleys covered with rice paddies, small farms, and villages. Off-road mobility was difficult and slow. Heavy traffic turned secondary roads into deeply rutted,

marginally trafficable trails. Battery commanders had to be especially imaginative in selecting and occupying battery positions since the opportunity to select a position in a tree line was rare. More often than not, batteries occupied villages, dried or frozen rice paddies, and river beds.

Division artillery organization

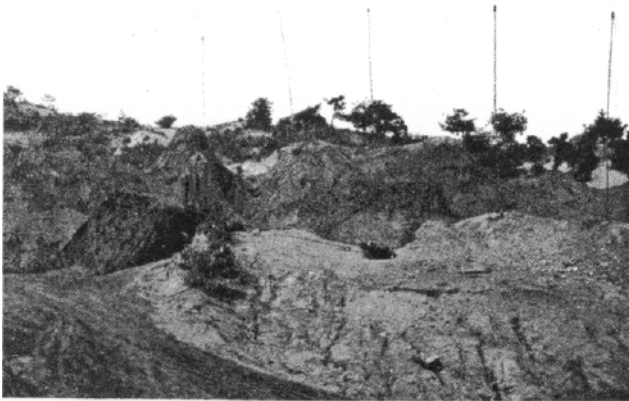
The 2d Infantry Division Artillery participated in Team Spirit '83 as a composite artillery force consisting of two organic battalions and three ROKA battalions. The 1-15th FA (155-mm, self-propelled) and the 1-38th FA (155-mm, M198 towed) were joined by Alfa Battery, 2-8th FA (105-mm, towed) of the 7th Infantry Division from Fort Ord, which was attached to the 1-38th FA. [Note: By the beginning of Team Spirit '84, the 1-38th FA had been redesignated as the 8-8th FA. — Ed.] (Two batteries from the 1-38th FA did not participate in Team Spirit due to operational requirements. Bravo Battery was preparing for disestablishment in conjunction with the arrival of Korea's first COHORT battery, and Charlie Battery was manning Fire Base 4P1 on the DMZ. Therefore, A/2-8th FA was attached to the 1-38th FA.) In addition to its organic artillery, the division artillery was augmented by ROKA — placed under the operational control of the division artillery were the 828th FA (8-inch, self-propelled), the 658th FA (155-mm, towed), and the 7th Artillery Battalion (105-mm, towed) of the Republic of Korea Naval Marines. To

provide additional support during the exercise, several ROKA field artillery units were placed under the operational control of the 2d Infantry Division Artillery as the situation warranted, to include the 72d Division Artillery, the Capital Mechanized Division Artillery, and a battery from the 777th FA (multiple launch rocket).

Training missions

The deployment to and from the Team Spirit exercise area was a major training mission for the division artillery units. During the actual conduct of the exercise, however, the units trained in deliberate river crossings; air movement, defensive, delay, and offensive operations; counterattacks; troop-leading procedures; and operations and signal security.

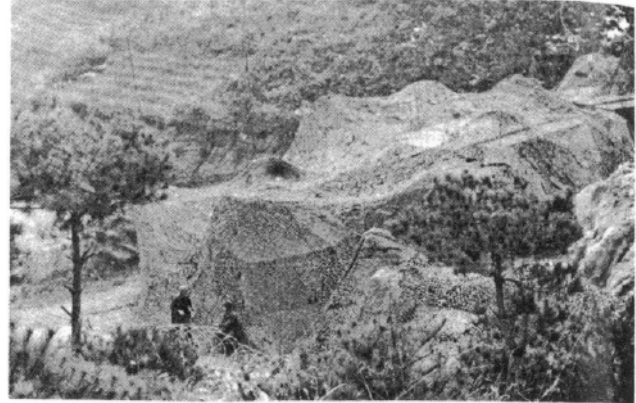
Team Spirit revealed that the division artillery's unique mission — providing general support reinforcing fire to a ROKA corps artillery when the division was in reserve and providing fire support to the 2d Infantry Division when it was committed — required a unique organization to allow the division artillery to fulfill its inherent responsibilities as a force artillery headquarters in combined ROK/US operations.



Communications

A major key to success in a combined ROK/US operation such as Team Spirit '83 is effective communications; but the Korean terrain and language difficulties worked against that ability. The mountainous terrain often precluded radio line-of-site between the division artillery headquarters and the organic and operational control battalions. (Although the use of radioteletype provided some relief in passing target and situation reports, it was not timely enough to compensate for the loss of the ability to communicate by FM secure voice.) To compensate for this restriction, it was necessary to establish FM radio retransmission facilities on mountains and ridgelines. It rapidly became apparent that the one authorized AN/VRC-49 retransmission facility was insufficient for highly reliable radio communications between allies. The dispersed locations of battalion command posts, mountainous terrain, and the short planning range of the AN/VRC-12 family of radios in the secure mode combined to force the division artillery headquarters to obtain an additional secure retransmission

facility from the 6-37th FA, which did not participate in Team Spirit '83. This additional secure retransmission facility greatly enhanced the division artillery headquarters' capability to communicate in the secure mode over extended ranges. (This experience has formed the basis for a request for a change to the modified table of organization and equipment which would authorize this facility to the headquarters.) Other techniques which minimized disruption in communications included the use of radio relays on top of mountains and ridgelines, directional antennas, and extensive wirelines.



Liaison operations

The division artillery functioned as the force artillery headquarters for both US and ROKA field artillery battalions, and so liaison operations were a significant aspect of the exercise. As in the case of communications, the modified table of organization and equipment proved to be less than adequate. The division artillery headquarters provided a fire support officer to the 2d Infantry Division Support Command to provide fire support for rear area security, and it beefed up the division main fire support element and the division tactical fire support element with an additional duty officer each. Each attached ROKA field artillery battalion furnished a liaison officer to the division artillery headquarters, which in turn furnished a US liaison officer to each of them and to the ROKA Corps Artillery. These numbers of liaison officers were required to deal with differences in employment doctrine and misunderstandings caused by the language barrier. Therefore, to meet the numerous requirements, division artillery battalions not participating in Team Spirit '83 were tasked to provide liaison teams consisting of a liaison officer, a Korean augmentation to the US Army (KATUSA) soldier, a liaison sergeant, and a driver with a 1/4-ton vehicle and radio. It is clear that for combined ROK/US operations, effective liaison is required to accomplish the fire support mission, but the division artillery was able to provide adequate personnel and equipment from organic assets only because there were just two division artillery cannon battalions committed to the exercise. To prepare for such real-world demands, the 2d Infantry Division Artillery has requested a change to the modified table of organization and equipment which would authorize additional

liaison assets to fulfill its responsibilities when it is assigned the mission of general support reinforcing to a ROKA corps. In addition, available personnel within the division artillery headquarters are being cross-trained in liaison responsibilities.

Rear area fire support coordination

As stated earlier, the Division Support Command fire support element was established to assist in rear area security. It consisted of a captain, a noncommissioned officer, and a driver equipped with a 1/4-ton vehicle with radio. The extended division boundaries made rear area security especially critical, but the field artillery units committed to the covering force battle were not in a position to provide fire support for rear area support elements. The Division Support Command fire support element coordinated the mortar fire of the reserve maneuver brigade and the fire support from those general support/general support reinforcing ROKA field artillery units which could range rear area targets. Here again, to prepare for this real-world mission requirement, the 2d Infantry Division Artillery has submitted a proposed modified table of organization and equipment change which would authorize an additional fire support element to coordinate fire support for the Division Support Command's defense of the rear area.

105-mm howitzer considerations

With the exception of the M102 105-mm battery located at Fire Base 4P1, the division artillery had no light artillery assets. The M198 155-mm howitzer had replaced the M102 in the 2-17th FA and the 1-38th FA; and, although the M198 provides a greater range, greater firepower, and a nuclear capability, there is a significant tradeoff in the trafficability of the M198 versus the M102.

The ROK Naval Marines 105-mm battalion and the 105-mm firing battery from the 2-8th FA were particularly flexible when terrain became the dominant factor in selecting a course of action. Although the 105-mm has a limited range, this shortfall was largely offset by its land/air movement mobility. Because it is a light weapon, it was possible to select battery positions which would not support an M198 or M109A2. Additionally, the force commander had a wider mixture of calibers with which to influence the battle. Team Spirit '83 proved that the direct assignment or attachment of a 105-mm unit to the division artillery is both desirable and necessary.


Split and jump tactical operations centers

The division artillery headquarters tested the concept of a split tactical operations center as a way of enhancing its survivability and flexibility. This arrangement *did* increase the headquarters' ability to locate in wooded areas and to move a smaller element forward in a shorter period; but the headquarters experienced increased difficulty in coordinating within its staff, in arranging responsive logistics support, and in providing adequate security.



The division artillery headquarters also tested a modified jump tactical operations center concept to provide for sustained operations in a displacement situation. Either the operations van or the S2 van jumped; both were interoperable and had the same number of map boards, radios, and copied overlays. The operations van normally carried the current situation, fire control, and plans maps; the S2 van had the order of battle map and the target production map. In jumping, the plans map in the operations van became the S2's order of battle map; and the current situation map became the target production map. The substitution of M577s for the expansible vans would help to speed displacement and improve off-road mobility.

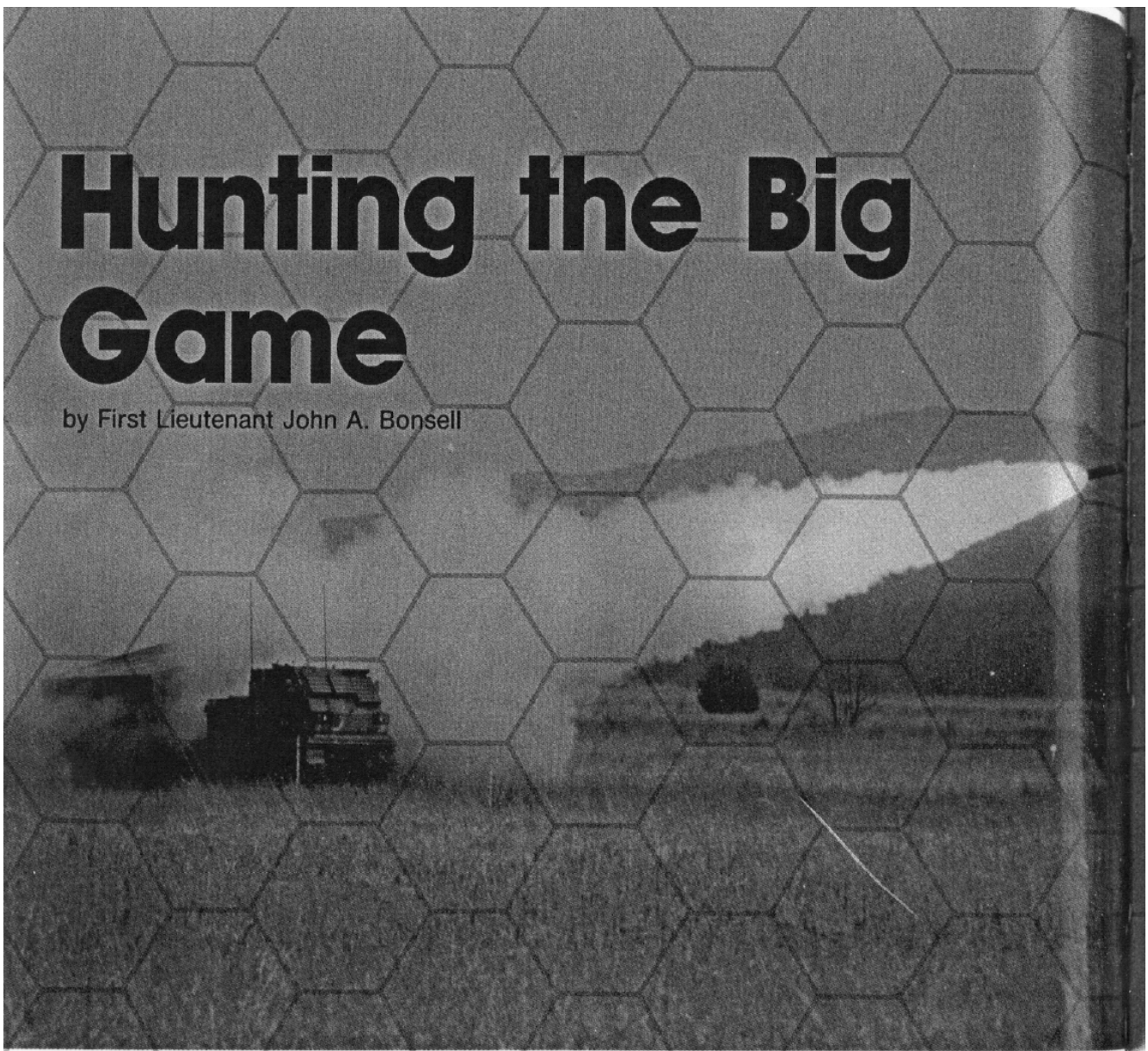
Conclusion

Team Spirit '83 reinforced the entire 2d Infantry Division Artillery's reputation for excellence in fire support; but it also served to focus the division artillery headquarters on additional requirements in organization, equipment, and tactics. The real-world Korean battlefield presents challenges different from those facing units who must meet the Warsaw Pact threat; and so, while successfully training with what it has, the 2d Infantry Division Artillery is taking steps to bring its modified table of organization and equipment in line with the demands of METT. The spirit of the Pusan perimeter and Chipyeong-ni lives on today, especially in the Indianhead field artillerymen who are insuring that warring with the Warriors is a no-win proposition for the enemy. 

CPT David W. Davis, FA, received his commission through the ROTC at Mercer University. A Field Artillery Officer Advanced Course graduate, he has served in Lance and cannon units. He commanded the Headquarters and Headquarters Battery of the 2-28th FA in Germany and was an area commander for the Recruiting Command in Washington, DC. When he wrote this article, he was an operations duty officer with Headquarters, 2d Infantry Division Artillery, in Korea.

Hunting the Big Game

by First Lieutenant John A. Bonsell



Wouldn't it be great to learn all the valuable lessons that field training offers without leaving the motor pool? It sure would be nice to gather platoon leaders, platoon sergeants, and section chiefs into one room and practice tactics and decision making, maneuver vehicles over terrain, practice radiotelephone procedures, and test standing operating procedures (SOPs) — all without coordinating chow, using one penny of training funds, or scheduling range areas. The hunt for such simulations — a big game target in training — goes on. But a new Multiple Launch Rocket System (MLRS) tactical simulation game accomplishes these feats and more. It can help teach soldiers how to plan movements, deal with an unexpected crisis, set up firing platoon areas, and teach SOPs without all the problems that a

movement to the field would cause. It obviously is not a complete substitute for field training, but it has merits which are worth every Redleg's consideration.

The game, which is played on a 5-by 10-foot game board, eliminates the worry of scheduling training. One can have as many supervisors in the battery play as one likes. Even section chiefs can maneuver their game pieces and make critical decisions when a crisis arises. If the MLRS battery commander wants only platoon leaders present to teach them tactics or enforce some special procedure, so be it. They can maneuver the game pieces and make the decisions for all of their troops.

Each game comes with two large laminated plastic game boards. One board is actually a large map of Fort Sill with a hexagon design superimposed. Each

hexagon represents 333 meters distance. Players move through the hexagons and are assessed various numbers of movement points per hexagon. As with actual terrain, some areas are impassable to certain vehicles. Other areas can be crossed, but more maneuver points are assessed for those hexagons because it would take more time. The players are only given a limited number of movement points; thus, if they are traveling over rough terrain, they cannot go as far as if they were travelling down a road or through an open field.

Included with the large playing board are several smaller boards which represent a four grid-square portion of the main playing board, but on a much larger scale. On the smaller board the platoon leaders and section chiefs maneuver their game pieces according to a different scale and number of movement points per hexagon. But here again point assessment is related to terrain.

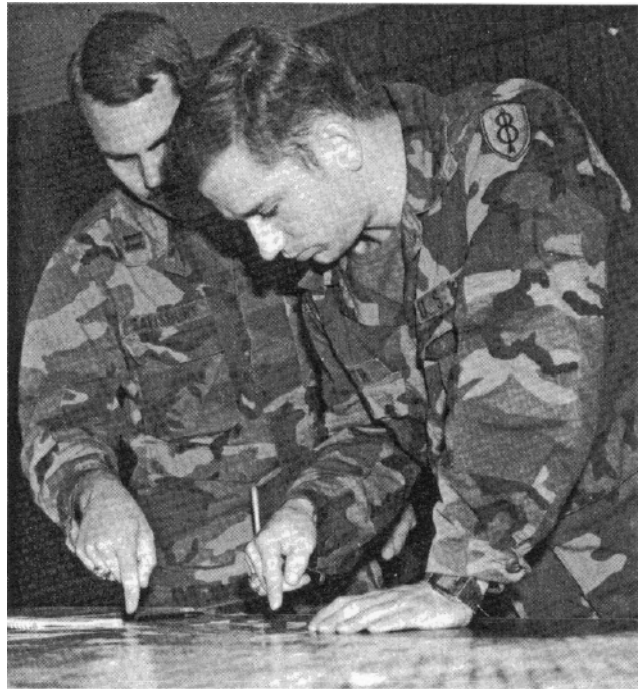
These small boards allow the platoon leader to set up his area tactically as he would in the field. The self-propelled launcher/loader must update its position determining system frequently, and so the platoon leader must place survey control points in his platoon area — preferably near resupply points that the self-propelled launcher/loader must visit anyway. The platoon leader will also choose hide areas and launch areas for the launcher/loader using the information given on the map.

Platoon leaders are not the only players who must set up their headquarters areas. The first sergeant is given a smaller board which is also shaped like a hexagon but scaled the same as the platoon boards. On this small playing board the first sergeant positions maintenance, mess, supply, the fire direction center, and the ammunition holding area. The first sergeant must consider cover for vehicles, road networks, and other positioning considerations.

The second large playing board is only a white sheet with hexagons and grid squares printed on it. It is to be used by the unit to adapt the game to the unit's training area. With a few color pens and the use of the key in the instruction manual, a unit can use a map of its training area and represent the same terrain on the playing board. Thus the unit can use scenarios that directly affect them and help familiarize soldiers with the battery training area. The blank board will also have smaller blank boards to represent platoon and battery headquarters areas.

The small pieces that represent vehicles are simply small pieces of cardboard with printing on them. An MLRS battery has 50 vehicles, and each one is represented separately in the game. Survey control points, reload points, and pieces representing various headquarters elements are also used. Each game piece that represents a vehicle is printed with information showing what kind of vehicle it is and how many maneuver points the vehicle has.

The game controller usually starts the game by reading a scenario. He actually sets the pace of the game and controls everything that happens. He may



Photos by Sam Orr

read a scenario supplied in the rule book, or he may make one up. Usually the game controller is the battery commander, and his scenario could be as simple as "We are moving to the field Friday. The following is your grid location. . . . The game will start with a convoy from the motor pool."

The game controller also controls the fire mission cards for the fire direction center and the situation cards that introduce various problems to the platoons. During each game turn, the fire direction center draws a fire mission card and assigns fire missions to the various firing sections. After each turn, the game controller rolls dice to see if the platoon must draw a situation card.

The game contains several situations for each major platoon or section. Some represent maintenance problems; others represent personnel problems. When a platoon leader draws a card, he must describe the action he would take to resolve the problem or actually simulate calling the fire direction center to request assistance; i.e., if the 1st platoon leader draws a situation card that reads "One of your self-propelled launcher/loaders rotated the launcher loader module (LLM) into a tree, and it will not rotate," the platoon leader must call his self-propelled launcher/loader operator and tell him to move to a hide area with the launcher/loader module elevated. The platoon leader then must call the fire direction center: "S1V, this is GZC. I request maintenance at this location; one of the self-propelled launcher/loaders has a launcher/loader module that will not stow, over." At this point, the fire direction center will notify the maintenance section chief; and, when the maintenance section chief begins his turn, he will respond by moving one of his vehicles out of the battery headquarters area toward the 1st platoon firing position.

Situation cards are not the only events determined by rolling the dice. Each time a self-propelled



launcher/loader fires a mission, it is subject to enemy counterfire. When a self-propelled launcher/loader section chief is given the mission to fire, he will move to a firing point during his next game turn. During this move he will use a certain number of maneuver points, which represent available time. Depending on the terrain, he will arrive at the firing point with a reduced or *greatly* reduced number of maneuver points. When the mission is fired, more points are deducted for time. When the firing mission is finished, he will scoot from the firing point to a reload point or hide area as quickly as possible. Of course, with a limited amount of points, it is unlikely that he can reach his destination on that game turn. The game controller rolls the dice and reads an accompanying chart to see if the self-propelled launcher/loader was acquired by enemy radar. If it was, the dice is rolled to choose the weapon the enemy is using — multiple rocket launcher, 152-mm guns, etc. Once the weapon is chosen, the dice are thrown to determine whether the launcher/loader has been hit. A chart will show whether, within a certain radius of the launch point, all friendly vehicles have been destroyed. If the launcher/loader is far enough away, it is safe.

This is how a typical game turn may sound:

Game controller: "1st platoon FDC gave you a 12-rocket fire mission during this round of turns. Your first section launcher/loader was designated as hot; so you must fire the mission."

1st platoon leader: "I have 30 maneuver points. My launcher/loader will move across this field of 3 hexagons (2 points per hex), then up this road of 3 hexagons (1 point per hex), through this wooded area and stream of 1 hexagon (4 points per hex), across this field to the firing point (2 points per hex). I have used 15 maneuver points; I have 15 points remaining."

The game controller: "OK. To fire the 12-round mission will cost you 5 points."


Platoon leader: "OK. Now my launcher/loader will move across the field 3 hexagons to the road and move down the road 4 hexagons."

Game controller: "OK, let me roll the dice. You are acquired by a multiple rocket launcher; now let's see how far away you must be. You must be 5 hexagons away. One, two, three, four, five, six. You made it. Now I'll roll to see if you get a situation. Yes, draw a card."

First platoon leader: "Your launcher/loader has just thrown a track. I will direct the crew to put on the track and call for maintenance if it is required."



The game, although constructed initially for MLRS, could be adapted for use by cannon, Lance, or Pershing batteries. With hard work, imaginative Redlegs can change most of the game pieces and scenarios. Instead of launcher/loaders, it could be M109s firing the missions; and platoon leaders or executive officers could be responding to counterbattery fire.

The value of the game itself cannot be overly emphasized. It is a field artillery game for field artillerymen. The players can learn how to deal with complex maintenance and logistical problems, set up a tactical platoon area, reconnoiter new areas, and use existing SOPs or add new ones — all without getting the vehicles out of the motor pool or ordering chow. No maneuver damage will be caused, each soldier can go home at night, and a day of playing can simulate an entire week in the field. It is already helping one MLRS battery train its leaders at minimal cost and with great dividends. Local Training Audiovisual Support Centers have bagged this game and will present it soon under number 6-13-1 (Salisbury's Command). 

1LT John A. Bonsell, FA, received his commission through the ROTC at Penn State University where he was a distinguished military graduate. His first assignment was with the 1st Training Brigade at Fort Jackson, South Carolina, first as executive officer of Battery A, 4th Battalion, and then as S3 of the 5th Battalion. He was then assigned to the 3d Battalion, 16th Field Artillery, as an ammunition platoon leader in Battery C and is currently the battalion operations officer.

View from the Blockhouse

FROM THE SCHOOL

Journal notes

• With this issue, Major Terence Freeman ends his tour as editor. His successor will be Major Roger Rains, FA. Major Freeman's staff thought that *Journal* readers might want to know what the former editor looked like; so we sneaked in a picture of him.



• It will soon be time for the annual address verification process. Addresses which appear on the free circulation mailing list will be mailed a form which requires that the mailing address be verified — acronyms and office symbols are *not* an acceptable part of the address and must be spelled out by each addressee. Failure to return the address verification results in an automatic deletion of that address from the mailing list.

• The "Journal notes" in the next issue will contain a brief summary of the recently completed readership survey and the announcement of the two \$200 writing awards presented by the United States Field Artillery Association.

• Ms. Jan McAdams, the circulation manager/secretary of the *Journal* staff, has been promoted to an editorial position in the Field Artillery School's Directorate of Training and Doctrine. Her clerical and administrative skills have kept the entire process of publication running smoothly over the last three and one half years.

Professional development pamphlet for enlisted soldiers

The School's Field Artillery Proponency Office has developed a field artillery professional development pamphlet for enlisted soldiers. It covers career progression and development in all field artillery MOSs. Initial distribution was made in late March 1984 to all field artillery battalion, brigade, division artillery, and corps artillery command sergeants major. Additional copies may be requested by writing to:

Commandant
USAFAS
ATTN: ATSF-AF
Fort Sill, OK 73503

Safety tips

M109: The M109 self-propelled howitzer has a raised portion welded to the left of the accelerator pedal which could be mistaken for the brake pedal. There has been at least one incident in which a driver thought he had moved his foot off the accelerator and onto the brake pedal; instead, thinking he was braking, he stepped down on the raised portion of the accelerator and caused the vehicle to lurch forward and fatally injure a ground guide. Until this hazard can be eliminated, commanders are urged to ensure that personnel who are required to operate these vehicles are fully trained on the hazards involved.

M993: An unsecured driver's louver on the MLRS carrier M993 can fall down and injure personnel. Users must ensure that the locking pin on top of the cab is in place to secure the louvered windshield cover in the stowed position. They should check lock pin engagement in the louver lock before raising the cab; should not attempt to raise the cab when either the locking pin or top strike are inoperative; and, while raising the cab, should stay clear of the driver's louver in case it swings down unexpectedly.

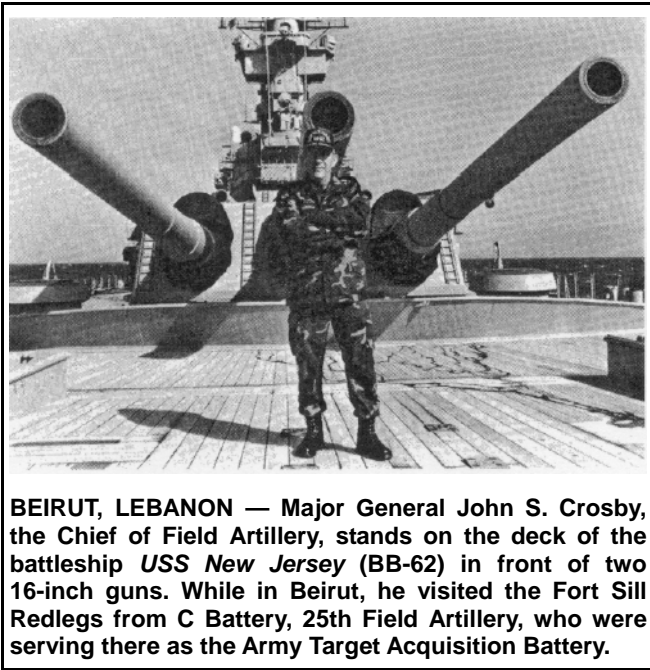
New 13B and 13F job books

New individual job books have been distributed to the field for MOS 13B10/20 (field artillery cannon crewman) and MOS 13E10/20 (cannon fire direction specialist). The new individual job books supersede the section job books initially distributed in 1982. For example, TC 6-13B1/2 (JB) dated August 1983 supersedes TC 6-13B1/2 (JB) dated August 1982; and TC 6-13E1/2 (JB) dated August 1983 supersedes TC 6-13E1/2 (JB) dated June 1982. The section job books will no longer be used.

Those units that have not received their quota of the new individual job books may requisition them from the US Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, Maryland 21220. (Henry P. Brandt, Directorate of Training and Doctrine)

Correction

It has come to my attention that the authorial credit for "Faithful and True" in the March-April 1984 issue should have included the name of First Lieutenant Kimberly E. Gorum, FA, an ROTC graduate from the University of South Alabama who has held a variety of assignments within the 1-5th FA. — Ed.



BEIRUT, LEBANON — Major General John S. Crosby, the Chief of Field Artillery, stands on the deck of the battleship USS New Jersey (BB-62) in front of two 16-inch guns. While in Beirut, he visited the Fort Sill Redlegs from C Battery, 25th Field Artillery, who were serving there as the Army Target Acquisition Battery.

PTC/BTC training

Every minute of training time must produce measurably enhanced proficiency; every dollar resourced for training must show a net profit in total combat readiness improvement. Commanders realize this truism, and yet they are not taking advantage of one way of increasing their noncommissioned officers' technical proficiency. Only 70 to 75 percent of the spaces available in Primary and Basic Technical Courses (PTC/BTC) are being filled. Worse yet, the wrong soldier often receives the training because MILPERCEN is selecting no fewer than 80 percent of the attendees on the basis of records screen only — i.e., *without* benefit of the commanders' recommendations. The "credit" for this condition rests squarely on the shoulders of commanders. In some cases in which the "TDY and return" mode was offered for NCO attendance at PTC/BTC, commanders were reluctant to release either the soldier for the duration of the course or the necessary TDY funds — or both. Therefore MILPERCEN places PTC/BTC attendees in a "TDY en route" mode; i.e., in conjunction with a permanent change of station. Thus the commander, who should be the one most interested and involved in training his NCOs, is effectively cut out of the evaluation and selection process. The Department of the Army is currently looking at a recommendation for central selection and management of PTC/BTC beginning in FY86 and is also examining the feasibility of a quota management system — two approaches which also cut the commander out of the process.

Commanders at every echelon, but especially at battery and battalion level, should vigorously pursue the highest possible state of combat readiness for their units — an objective that is impossible to achieve without competent,

motivated, and technically proficient key personnel. Thus, the commander should —

- Select the best NCOs for attendance at PTC/BTC service school courses.

- Send selected NCOs in a "TDY and return" mode in accordance with guidance established in AR 351-1 (15 Jan 84). Detailed procedures are given in DA Pam 600-8, *Military Personnel Officers Guide: Management and Actions Procedures* (paragraph 3-10, "Application for Army Service Schools").

- Reevaluate the priorities of their TDY dollars and assign NCO training the high priority it deserves. While the unit mission has the highest priority, the long view of the benefit to the Army and the positive effects on NCO development clearly support this objective.

Eligibility for available courses is outlined in AR 351-1, chapter 6, which essentially requires that an applicant be in grade E5 or E6 and have his or her commander's recommendation. Currently available at the Field Artillery School is a basic technical course for MOS 31V30, tactical communications chief, which is a 10-week, 3-day course that requires a SECRET security clearance. The MILPERCEN point of contact who can assist with applications can be reached at AUTOVON 225-7790 or 7791. In addition to the one existing course at Fort Sill, the Field Artillery School is establishing basic technical course offerings for many more MOSs related to the field artillery. These courses will commence in FY85 — some as early as October 1984. Here are the MOSs which will have BTCs:

- 13R30—FA Firefinder radar section chief.
- 15D30—MLRS/Lance missile section chief.
- 15E30—Pershing missile section chief.
- 15J30—MLRS/Lance fire direction computer/assistant section chief.
- 17B30—FA radar section chief.
- 17C30—Target acquisition section chief.
- 21G30—Pershing missile electronics specialist.
- 31V30—Tactical communications chief (on-line).
- 82C30—Chief of survey party.
- 93F30—FA meteorology section chief.

The courses are listed in the USAFAS schedule of classes for FY85. If a unit does not normally receive a copy of this schedule, it may obtain a copy through a request to Commandant, US Army Field Artillery School, ATTN: ATSF-DCC, Fort Sill, Oklahoma, 73503.

The NCO is the backbone of the Army. His or her professionalism, dedication, and energetic pursuit of excellence must be coupled to and supported by technical competence and proficiency. The Army's PTC/BTC program is designed to achieve this goal, but the commander must recognize the value of training and then actively and positively support it. (Dr. Charles E. Mehring, Directorate of Training and Doctrine)

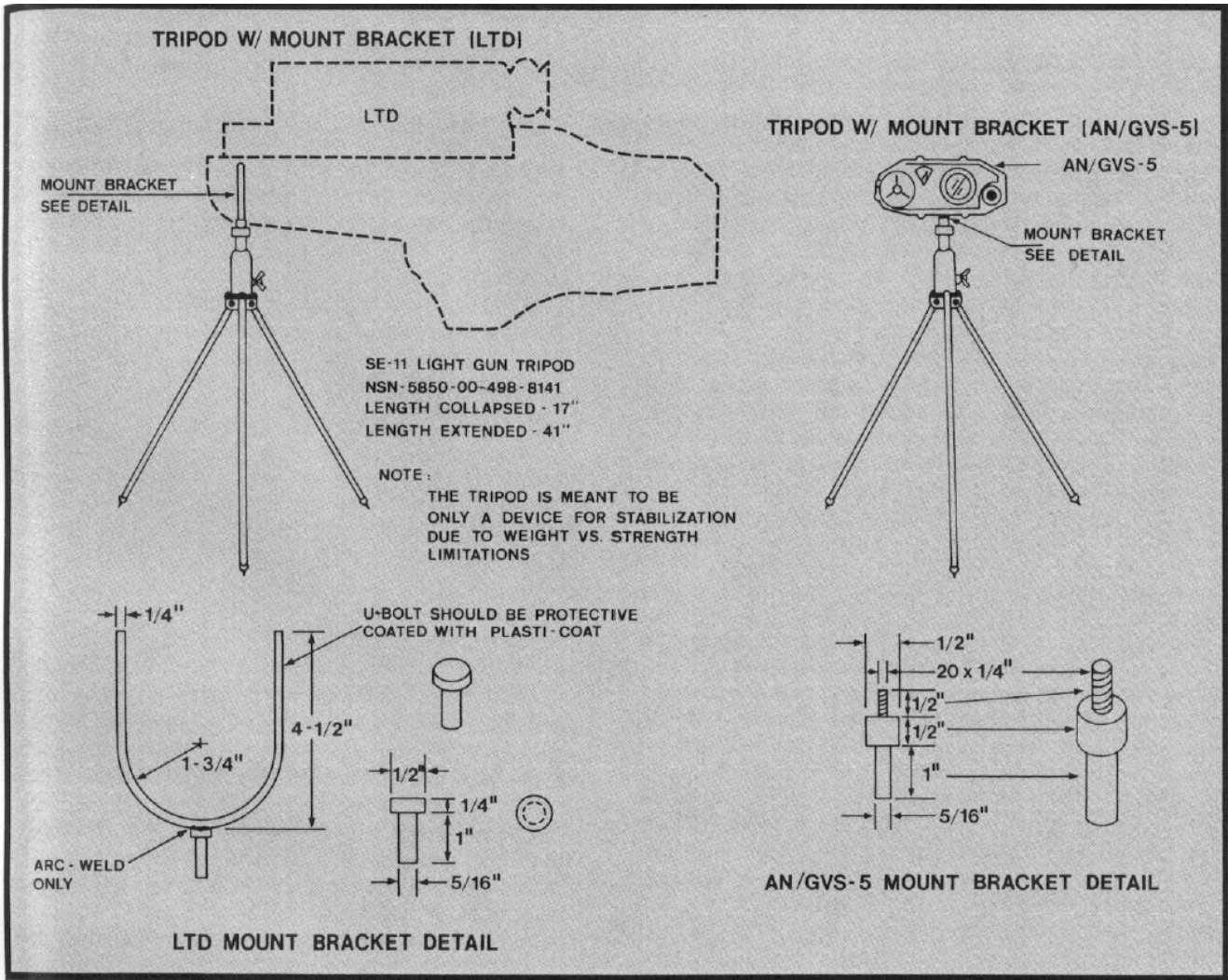


Figure 1. Tripod with mounting brackets for laser target designator (LTD) and infrared observation set AN/GVS-5.

Tripod passes test

The accuracy of the laser target designator, a hand-held device used to designate moving and stationary targets for laser-guided munitions, is adversely affected by movement as slight as the human heart beat. To correct this problem, the 1st Ranger Battalion, 75th Infantry, has devised and successfully

tested a tripod (figure 1) which steadies the laser target designator and allows accurate tracking of moving targets. The tripod, a light gun tripod which was originally designed to hold a signal light, has also been adapted by the Gunnery Department, US Army Field Artillery School, for use with the infrared observation set AN/GVS-5. A study of the tripod's applications is ongoing at Fort Sill.

Wear of the award of the Order of Saint Barbara

The November-December 1983 edition of the *Journal* outlined the Chief of Field Artillery's official policy for the wear of the award of the Order of Saint Barbara. For the sake of those who may not have seen that issue of the *Journal*, the official policy is repeated here. Members of the Order of Saint Barbara should wear their awards with intense pride and decorum. They must, however, be extremely judicious in their

choice of the occasions for wear. Appropriate occasions are purely Field Artillery social functions such as a Saint Barbara dining-in or induction ceremony or a field artillery unit dining-in or party. Inappropriate occasions are social functions which are not purely Field Artillery where wear of the award would obviously conflict with uniform standardization. Examples would be an AUSA meeting or the ceremony of another branch or service. The field artillery commanders in the rank of full colonel or above are responsible for enforcing this guidance.

Reserve Components officer training

Since Army National Guard and United States Army Reserve (USAR) units contain over 50 percent of the Army's field artillery personnel, Reserve Components training is of vital importance. The Army Correspondence Course Program has long been an integral part of this training; but it is extremely difficult, if not impossible, for an artilleryman to become proficient at collective tasks through correspondence courses alone. Therefore, the Field Artillery School has taken several steps to provide a flexible training program which will ensure that Reserve Components field artillery officers are proficient in all of their duties and responsibilities. Chief among these steps is increased resident training for Reserve Components officers.

Officer Basic Course

In early 1982, the Field Artillery School convened a strategy board to review the task list for the Officer Basic Course and develop a viable alternative to the resident course. The strategy board consisted of Reserve Components officers and representatives from the Army Reserve Personnel Center and the Field Artillery School. The board determined that the most critical duties which a new field artillery lieutenant would be assigned were those of a forward observer, fire support team chief, fire direction officer, and executive officer at battery level. It then developed a four-phase combination resident/correspondence course consisting of a two-part first phase and three additional correspondence courses which included all tasks taught in the resident portion of the first phase.

In this first phase, the individual completes 55 hours of instruction by correspondence and then takes a preattendance examination. If the individual passes this examination, he or she attends an eight-week resident course followed by three phases of correspondence courses. Failure to pass the preattendance examination indicates that the individual does not possess the necessary basic skills to complete the resident phase successfully. The local commander can waive the requirement for the initial correspondence course based on the lieutenant's background, experience, or previous schooling; but the officer still must take the preattendance examination prior to attending the resident phase. Completion of the resident phase qualifies the Reserve Components officer in the basic collective tasks of the Branch, but he or she still needs the three follow-on correspondence courses to complete basic individual training.

Officer Advanced Course

There are now four ways for a Reserve Components officer to complete the Advanced Course: the resident course, the Army Correspondence Course Program, the 12-week resident short course, and the USAR Schools' Program. This last option is especially innovative. An

individual completes Phase I of the Advanced Course through correspondence courses or inactive duty training at a USAR school and then goes to Fort Sill for Phase II. At Fort Sill, the officer will be given a diagnostic test; and, if the officer does not pass the test, he or she is enrolled in a preparative course which replaces the current Phase 1A. Successful completion of the diagnostic test automatically enrolls the student in Phase II and reduces his or her Active Duty for Training to only three phases. This change to the program of instruction, which will be fully implemented in training year 1985, will ensure that the Reserve Components officers receive sufficient hands-on, realistic training during their advanced instruction.

As the task lists for the Officer Basic and Advanced Courses are revised or changed, the Army Correspondence Course Program, USAR School program of instruction, and short courses will be updated. This constant review also ensures that the current weaponry and organizational structure in the Reserve Components are addressed. If Reserve Components commanders ensure that their officers attend the appropriate training at the appropriate time, they will have guaranteed that their battery-level leaders are well-trained in their technical and tactical skills.

FA tactical data system hotline

As reported in the September-October 1983 *Field Artillery Journal*, the Field Artillery School created a 24-hour hotline in October 1983 for reporting problems with the software in field artillery tactical data systems. Since then, there have been only two significant problems reported on this line. It appears, therefore, that units are developing and instituting their own methods to circumvent problems. While these solutions may be good for each individual unit, they may not permit interoperation on the battlefield. Therefore, in order to guarantee interoperation, field units should immediately notify the School's Tactical Data Systems Division when they discover any problems with the software of field artillery tactical data systems. The two best means of notification are a phone call or a letter:

- Call: 24-hour hotline, AUTOVON 639-5607 or commercial (405) 351-5607. (If the call is made after duty hours, it will be recorded.)
- Write: Commandant
USAFAS
ATTN: ATSF-CT (BCS or TACFIRE or
LANCE or MLRS)
Fort Sill, OK 73503

Normal methods of submitting a request for change to the software remain in effect. But a call or letter which alerts the Tactical Data Systems Division of a problem enables the software developers to get started on their analysis and may result in the early fielding of corrected software. (CPT(P) John B. Broyles, DCD)

Fragments

FROM COMRADES IN ARMS

New velocity measuring system

The Instrumentation Directorate at White Sands Missile Range has been testing a prototype of a new velocity measuring system. Called the Real Time Velocimeter System, it will gauge the performance of various projectiles and munitions.

Upon successful completion of testing, the new system will be turned over to the Test and Evaluation Command for use at its test ranges. It will provide a bullet's or projectile's velocity and acceleration, azimuth and elevation angle, and the range or distance from the firing point.

The multimillion dollar Real Time Velocimeter System prototype consists of an antenna and associated pieces, which are mounted on a trailer, and the control and support equipment, which are housed in a van. The radar can be placed in a hazardous area while the operating personnel and computer equipment remain in a safe, remote location in the van.

The new velocity measuring system not only does the same job better than the old radars, but it also does more. The system has the capability to produce both velocity and range data in real time. Radar waves are bounced off the bullet or projectile back to the velocity measuring system. Because the object is moving away from the radar, the wave's frequency is shifted as it bounces back — an effect commonly known as the Doppler shift. By rapidly measuring the magnitude of the shift, the computer calculates the velocity of the projectile through a unique set of software. Simultaneously, the computer processes data from three separate radar frequencies and computes the range of the projectile. The system will then display this range and other information in real time. Real time is a relative term and actually refers to the delay from the



During military training exercises at Fort Irwin, California, a US infantryman simulates the operation of a portable antiarmor missile system. The new weapon will use a staring focal plane array infrared seeker and tracker being developed by Hughes Aircraft Company for the Tank Breaker program. The proposed missile will be supplied in a throwaway launch tube-storage container; and the complete system, including the missile, will weigh less than 35 pounds. (Hughes Aircraft Company photo)

time a measurement is made and the time it is displayed. In the past, velocity and range calculations have taken hours to produce. With the new system the readouts will be available as the projectile actually flies to its target, and the printouts follow immediately thereafter. Personnel can take an instant look at the performance of the projectile and then make changes after each firing without significant delays. (J. Eckles, PAO, White Sands Missile Range, NM)

Redleg Newsletter

ITEMS OF GENERAL INTEREST

SOCAD — What Is It?

The Service Member's Opportunity College Associate Degree (SOCAD) program is an Army plan which gives credit for military experience and allows a participant to earn an associate degree while serving as a full-time soldier. The whole program is based on a curriculum that is job-related. Once the individual is signed up in a program of study at a participating Service Member's Opportunity College Associate Degree institution, his credits transfer with him to his new service home or to his civilian residence as long as he enrolls in another Service Member's

Opportunity College Associate Degree institution.

Curriculum areas presently include accounting, automotive maintenance technology, aviation maintenance technology, civil engineering technology, communications electronics technology, computer maintenance technology, construction, data processing technology, diesel maintenance technology, digital electronics technology, food service management, law enforcement services, management science, medical records technology, office management, transportation technology, and a category termed "flexible." The occupational areas relate directly to enlisted and

warrant officer job specialties, while the flexible area is normally a general education study program that allows at least half of the degree to be completed by electives.

For years now, degree completion has been more difficult for the military person than for his civilian counterpart due to difficulties in transferring credits from one school to another. The Service Member's Opportunity College Associate Degree program provides protection for the participant through the signing of the Student Agreement by both the soldier and a duly authorized representative of the "home" participating college. This agreement guarantees the transferability of courses based on a single official evaluation. Subsequent courses are transferred back to the home college instead of being carried forward for evaluation by each new college. The home college is the degree-granting institution.

The Student Agreement is normally filled out after the student has completed some credit hours (usually six) at his Service Member's Opportunity College Associate Degree institution and has requested an official evaluation of his military and civilian education. (Some colleges routinely complete the Student Agreement without waiting for an official request from the student.) Once the student has been enrolled in a curriculum network at an approved

college, courses earned will automatically be accepted in transfer with no prior approval and no reevaluation of previous credits at the new participating college.

Soldiers stationed in Europe may also take advantage of the program. Interested persons should contact their local education center for more information. (Rebecca Dunford, Army Education Center, Fort Sill, OK)

Correction

To request an appointment to visit the official files section of MILPERCEN, an officer should call AUTOVON 221-9618/9619 instead of 221-9816 as listed in the November-December 1983 *Journal*.

New FA Branch chief

Lieutenant Colonel William H. Ott has replaced Lieutenant Colonel (P) Ken Simpson as Field Artillery Branch Chief, US Army Military Personnel Center. Lieutenant Colonel Ott has a master of arts degree in personnel management and administration from Central Michigan University. His varied assignments include field artillery battalion command and duty as a professional development officer at the Military Personnel Center.

Command Update

NEW REDLEG COMMANDERS

LTC Ray E. Porter
6th Battalion, 5th Field Artillery

LTC Wharton D. Rivers
3d Battalion, 6th Field Artillery

LTC David L. Runnells
1st Battalion, 8th Field Artillery

LTC Timothy X. Morgan
2d Battalion, 8th Field Artillery

LTC Heinz A. Schiemann
3d Battalion, 8th Field Artillery

LTC Charles M. Black
5th Battalion, 8th Field Artillery

LTC William C. Smith
6th Battalion, 8th Field Artillery

LTC Terry L. Burns
1st Battalion, 17th Field Artillery

LTC James R. Murphy
1st Battalion, 18th Field Artillery

LTC Morris R. Faber
2d Battalion, 18th Field Artillery

LTC Anthony N. Kuykendall
5th Battalion, 29th Field Artillery

LTC Dennis M. Meredith
6th Battalion, 33d Field Artillery

MAJ(P) Marvin Wooten, Jr.
1st Battalion, 36th Field Artillery

LTC Wayne P. Kutasko
1st Battalion, 37th Field Artillery

LTC Samuel W. Floca, Jr.
3d Battalion, 37th Field Artillery

MAJ(P) Ronald E. Townsend
1st Battalion, 76th Field Artillery

LTC Ted K. Dowling
3d Battalion, 79th Field Artillery

MAJ(P) Philip J. David
1st Battalion, 80th Field Artillery

MAJ(P) Helmut R. Kiessling
1st Battalion, 83d Field Artillery

LTC Hugh A. Williams
3d Battalion, 84th Field Artillery

LTC Phillip W. Childress
1st Battalion, 92d Field Artillery

MAJ(P) Karl J. Leatham
1st Battalion, 94th Field Artillery

LTC Gilbert L. Bishop
1st Battalion, 321st Field Artillery

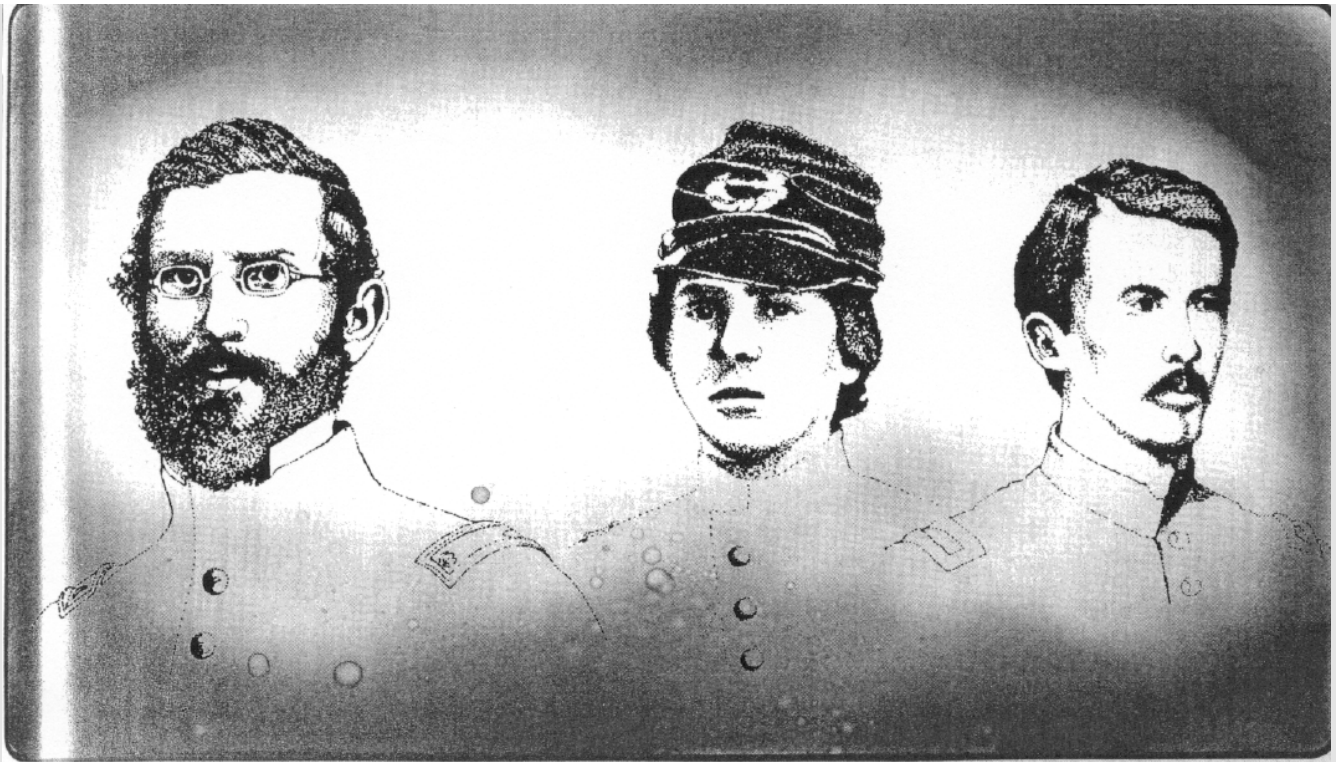
LTC Joseph P. Spielbauer
552d US Army Artillery Group

LTC Peter J. Bazzel
2d Cannon Training Battalion

LTC Joseph A. Kendra
4th Basic Training Battalion

LTC Wayne D. George
7th Training Battalion

LTC Steven C. Gregg
1st Battalion (BT), Training Brigade



Through Smoke of Distant Fires

by Colonel (Retired) Robert M. Stegmaier

The past is visible only through the haze of time. Just as the forward observer must see the battle through the smoke of distant fires, so must today's Redlegs penetrate to the lessons of the past. Models of Redleg leadership abound in the annals of American history — models which demonstrate that whenever field artillerymen take to the field of battle, with whatever tactics and equipment, their leadership is the force which weighs most heavily in the balance of success or failure. The following stories are shrouded in clouds of burnt powder from days long gone, but there are lessons there for those who would only strive to see them.

Along the Cortez Trail

The Mexican War became known as the artillerists' war. General Winfield Scott's campaign along the Cortez trail from Vera Cruz to Mexico City discloses why the war had a decidedly artillery-red color.

For artillery, the struggle for Vera Cruz started out auspiciously. Two navy gunboats and five gun schooners anchored opposite the landing beaches and intimidated the enemy so that no opposition met the landing force. In 10 hours, 12,000 troops, including

the 2d and 3d Artillery Regiments, were safely ashore.

After a careful reconnaissance of the city's defenses, General Scott decided that a siege was the best tactic to win the city with the least loss of life. The Engineers and Artillery chiefs were instructed to work together to prepare a plan for battery positions and submit the plan to the commanding general for approval.

Meanwhile, the various divisions, progressing to assigned blocking or investing

positions, met sporadic opposition. Ordnance Lieutenant G.H. Talcott's artillery checked two enemy cavalry attacks; and Lieutenant W.H. French (a future Union major general), 3d Artillery, broke up resistance from a stone magazine by bringing forward a 12-pounder.

After giving sufficient warning to Vera Cruz of his intentions, General Scott began bombardment. Lead poured from ten 10-inch mortars, four 24-pounder siege guns, two 8-inch siege howitzers, and three 32-pounder and

three 68-pounder naval guns. General Scott's memories of the bombardment are vivid:

Bomb shells were flying like hailstones into Vera Cruz from every quarter . . . Suddenly, a vivid lightning-like flash would gleam for an instant upon the black pall of smoke hanging over our lines, and then as the roar of the mortar came borne to our ears, the ponderous shell would be seen to dart upward like a meteor and, after describing a semicircle in the air, descend with a loud crash upon the housetop or into the resounding streets of the fated city. Then after a brief but awful moment of suspense, a lurid glare, illuminating for an instant the white domes and grim fortresses of Vera Cruz, falling into ruins with the shock, and echoing crash that came borne to our ears, told that the shell had exploded and executed its terrible mission!

For three days, this hail of bombs hit inside the city walls. Buildings tumbled, defenses began to crumble, and enemy guns were silenced. Most demoralizing of all were the rockets — similar to those that fell on Fort McHenry in the War of 1812, they lit up the sky and spread their deadly message to the sequestered garrison below. On the 25th, a flag of truce brought forth an unconditional surrender of the city and its most powerful fort, the castle of San Juan d'Ulloa.

There were many Redleg heroes. Although the exclusive use of artillery

limited the American casualties to less than 70, one casualty was Captain John R. Vinton, 3d Artillery, whom General Scott described as "one of the most talented, accomplished, and effective members of the Army. . . ." In his last letter home, Vinton wrote almost forebodingly:

My confidence in the overruling providence of God is unqualified, so that I go into the field of action assured that whatever may befall me will be for the best. I feel proud to serve my country in her time of appeal; and should even the worst, death itself, be my lot, I shall meet it cheerfully.

Another noteworthy artillery action took place on the road to Jalapa. Twenty-one thousand enemy soldiers, reinforced by two pieces of artillery, defended the Morena bridge on the Medellin road. A section of artillery under the command of Lieutenant Henry B. Judd responded to the challenge. A book on the campaign chronicles Judd's actions:

Lieutenant Judd was directed to approach with caution, as the road was circuitous, and the bridge was not visible within 50 yards of the fortifications. No sooner was he discovered than the whole fire of the Mexicans was concentrated upon him. . . . Lieutenant Judd, nothing daunted, opened up on the fortification; and, after six or eight well directed rounds, the heads of the enemy were no longer to be seen above the parapet.

When the US cavalry and infantry charged, the enemy broke and fled the bridge area. For his brave and resolute action, Judd was brevetted captain.

West of Vera Cruz was Cerro Gordo; and dominating the National Highway at that point was El Telegrafo, a hill surrounded by enemy artillery totalling 38 cannon. To the left of the National Highway were the fast-running Rio del Plan, rocky terrain, and enemy artillery batteries. To the right were piles of large rocks, innumerable gullies, and a forest of small trees. Two engineer officers, Captain Robert E. Lee and Lieutenant Pierre G.T. de Beauregard, reported that passage was feasible only to the right. Lieutenant U.S. Grant described the route they selected as follows: ". . . chasms so steep that men could hardly climb, animals could not. . . . Artillery was let down the steep slopes by hand. . . ." Three cannon of H Battery, 3d Artillery (one 24-pounder gun and two 24-pounder howitzers), were dragged by their crews and detailed infantrymen, lowered down and pulled up cliffs, placed next to the hill called Atalaya (which was near El Telegrafo) and then pulled to Atalaya's summit under cover of darkness. As one detailed infantryman wrote of the "impossible" event:

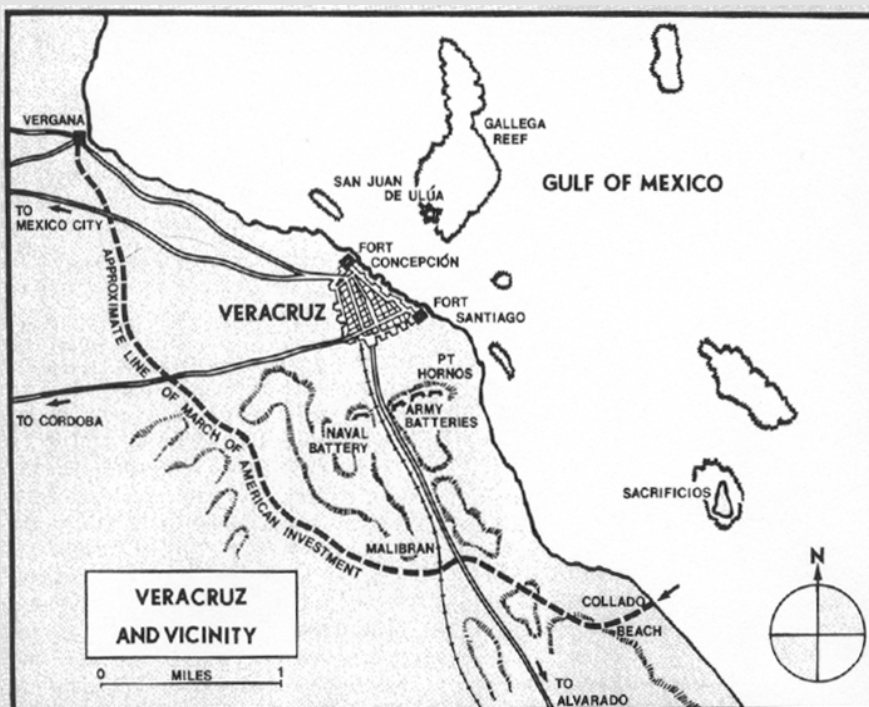
The gun was of immense weight, the hill steep and rugged, but the "suckers" were hitched on, and up that dreadful engine went, tearing down trees and crushing huge rocks in its course.

Atalaya, which dominated all terrain except El Telegrafo, had been left unprotected because the enemy considered it impossible to scale. As the Mexicans would repeatedly learn, to the Americans the "impossible" required just a little more effort.

In the morning, when H Battery commenced firing, the enemy was completely surprised. With the barrage as a signal, three regiments attacked, including the 1st Artillery acting as infantry. General Scott recalled the attack:

The brigade ascended the long and difficult slope of Cerro Gordo [El Telegrafo], without shelter and under tremendous fire of artillery and musketry with the utmost steadiness, reached the breastworks, drove the enemy from there, planted the colors of the 1st Artillery, 3d and 7th Infantry — the enemy's flag still flying — and, after some minutes of sharp firing, finished the conquest with the bayonet.

Of the many pieces of cannon captured, General Scott took six guns and formed a new light battery under the command of Captain John Magruder (later a

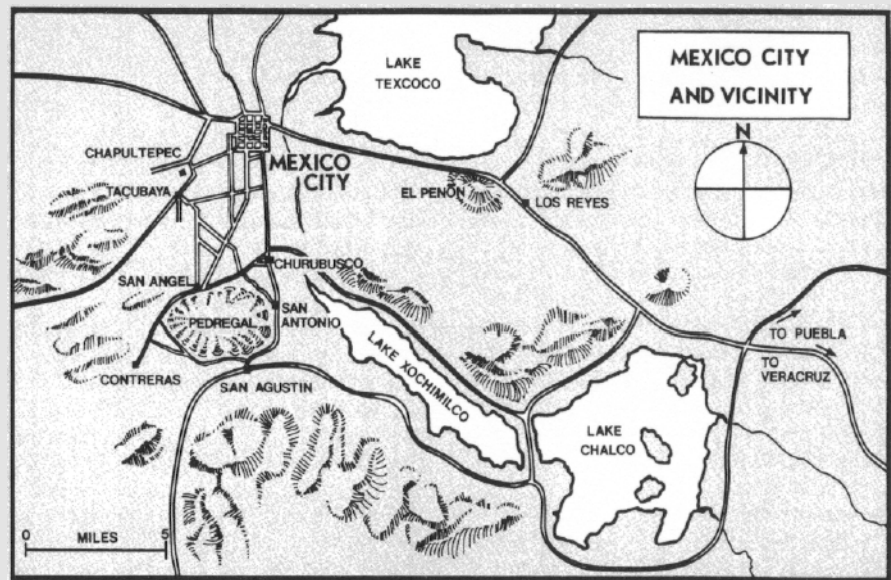


major general in the Confederacy). One junior officer who volunteered to join Magruder's battery was Second Lieutenant T.J. Jackson, who would one day become known as Stonewall; his stated reason for seeking the assignment was ". . . if any fighting was to be done, Magruder would be on hand."

The next important battles were at San Antonio, Contreras, and Churubusco — three victories in one day. At San Antonio, on the main highway to Mexico City, a US division was stopped by seven enemy guns. To the left of San Antonio, however, stood a hill which also overlooked Contreras. Engineer reconnaissance discovered a mule train across the volcanic, jumbled, seemingly impassable rock; and this trail was widened so that artillery could be positioned to fire on Contreras. The batteries of Captain Magruder and Ordnance Lieutenant Franklin D. Callender moved forward to positions only 400 yards from 22 large-caliber Mexican guns in Contreras. The ensuing artillery duel was too one-sided — 22 Mexican guns against 5 American guns. For two hours, this unequal contest continued; to escape the enemy shot, the Americans threw themselves flat on the ground each time the Mexicans fired and then jumped up to fire their own guns. After 15 artillerymen and 12 horses were killed or wounded and two of the five guns were disabled, the American batteries withdrew; but they withdrew only after providing covering fire to permit General Smith's units (to include the 1st and 4th Artillery Regiments) to pass to the right and to take position in San Geronimo.

The situation remained desperate; the American troops were caught between Contreras and overwhelming numbers of Mexican troops coming from Mexico City under personal command of General Santa Ana. The desperate situation demanded a desperate solution.

Engineer reconnaissance reported a path leading to the rear of Contreras hill. Departing in early morning in total darkness, the Americans marched up the paths, each soldier keeping a hand on the shoulder of the man to his front. At dawn, 2,000 American soldiers, supported by the 1st and 4th Artillery Regiments, attacked; and in 17 minutes they defeated the 6,000-man enemy force and captured 22 artillery pieces, including five 8-inch howitzers, two long 18s, three long 16s, and several 8- and 12-inch cannon. They also captured two cannon very special to the 4th Artillery — the two guns taken from Lieutenant J.P.J. O'Brien, 4th Artillery, at the northern battle of Buena Vista.



With the fall of Contreras and the enemy's subsequent abandonment of San Antonio, the US force turned to Churubusco, a strongly fortified chateau which was surrounded on all sides by a high and thick wall. Outside the wall was a fieldwork which commanded the approach in all directions and contained seven pieces of cannon. About 500 yards from the fieldwork was a canal crossing which was a *tête-du-pont*, or bridgehead, protected by a deep ditch and defended by three cannon. Santa Ana had ordered that Churubusco be held at all costs; and one of his defending units was the San Patricio Battery, a crack unit composed of US Army deserters.

Reconnaissance had been impossible because of the height of surrounding cornfields. The 1st Artillery, acting as infantry, first became aware of the strength of the defenses when, in its advance along the San Angel road, it was exposed to all the weaponry of the fortified walls. With great loss, the unit stood its ground. The battery of Captain Francis Taylor came up to assist, and General Smith reported the action:

. . . Taylor's battery had continued its fire uninterrupted by the severest shower of grape, canister, musketry, round shot, and shell . . . that was ever witnessed. The conduct of Captain Taylor, Lieutenant French, and the men who remained unhurt was the admiration of all who witnessed. The pieces were served as though on drill, while two of the officers — Lieutenants Martin and Boynton — and 29 men wounded and 15 horses crippled laid around and testified to the danger of their position.

General Twiggs' assault made no advance; the fires of the San Patricio Battery and the musketry of the sheltered infantrymen were too effective. Off to Twiggs' right, General Worth's 5th and 6th Infantry came roaring along the San Antonio road toward the *tête-du-pont*. Cannon fire initially stopped the units from direct approach along the main road, but two brigades turned to the right and in a determined assault captured the bridgehead. The three captured guns were immediately turned against the chateau, and the battery of Captain James Duncan was released to add its punch to the bombardment. A bystander estimated the intervals between reports from Duncan's battery at three seconds. The enemy fire from Churubusco slackened. The 3d Infantry and the 1st Artillery charged. Finally, when only 75 defenders out of the chateau's original 286 remained and the captured cannons at the bridgehead broke the advance of Santa Ana's 7,000-man reserve, the enemy formally surrendered.

Moving on toward Mexico City, a reconnaissance team led by Colonel Duncan, 2d Artillery, and Engineer Captain James L. Mason made a close reconnaissance of the enemy positions and made this report:

The enemy's left rested upon and occupied a group of strong stone buildings, called Molino del Rey, adjoining the grove at the foot to the hill of Chapultepec and directly under the guns of the castle which crowned its summit. The right of his line rested upon another stone building, called Casa Mata, situated at the foot of the ridge that slopes gradually from the heights above the village of Tacubaya to the plains

below. Midway between these buildings was the enemy's field battery, and his infantry forces were dispersed to either side of it. . . .

The center of the Mexican lines — the battery position — was selected as the target of attack. The assault guns of Ordnance Captain Benjamin Huger started the battle by firing on Molino del Rey. Other artillery concentrated on the enemy battery position while 500 selected men attacked and, at some cost in life, finally succeeded in capturing the guns. When, under cover of Huger's and Captain Drum's assault guns, Molino del Rey also fell, all of the captured guns were turned on the retreating foe.

Casa Mata proved more difficult. Duncan's battery bombarded it; but, to the surprise of the Americans, the Casa was not a fieldwork as reported, but a regular fortification manned by the most experienced troops in Mexican service. The US infantrymen drove the enemy out of its first-line position, but an overwhelming fusillade from the second lines prevented further advance. The Americans rallied around Duncan's guns as Mexican cavalry and infantry under Alvarez and Morales counterattacked. Here is what happened:

At the head of 4,000 cavalry, Alvarez now menaced our left. Duncan watched them come, driving a cloud of dust before them till they were within close range; then, opening with his wonderful rapidity, Duncan shattered whole platoons at a discharge. Worth sent him word to be sure to keep the lancers in check. "Tell General Worth," was his reply, "to make himself perfectly easy; I can whip 20,000 of them!" So far as Alvarez was concerned, Duncan kept his word. After repulsing the cavalry, Duncan turned his guns upon the Casa. Under the barrage, the enemy abandoned the position.

When the artillery beat back two enemy counterattacks on Molino, the battle ended.

The Chapultepec castle was the next objective. A reconnaissance disclosed two enemy batteries — one on the road in front which contained four guns and another on the flank with one gun which was capable of sweeping the low grounds on the left of the road and also between the road and the base of the hill. That discovery served to save many Americans in the next day's assault. A special force of 250 men, including 1st and 4th Artillery soldiers, was added to General Quitman's assault

division. Artillery Lieutenant G.P. Andrews pushed forward one gun to sweep the road leading to Mexico City and thus impede the flow of reinforcements into Chapultepec. Newly established Batteries 1, 2, 3, and 4 pounded the defenders of the castle and outworks and softened the positions for the final assault.

When the batteries stopped their barrage, the multidivision assault began. The 1st and 4th Artillery, acting as infantry, captured the guns discovered in the original reconnaissance. As the assaults showed signs of success, the enemy on the road from Mexico City threatened to reinforce the castle. General Worth was ordered to neutralize the move, but his advance was stopped by a well-entrenched cannon which was commanding the road. At this juncture, a courier on a lathered horse galloped up to Captain Magruder, who listened and called for Lieutenant Jackson. Despite the heavy enemy fire, Jackson galloped up the causeway with two guns and crews until he was stopped by a ditch across the road:

At the ditch, the gunners jumped to the ground and manhandled one gun across. Without waiting for the other, Jackson slewed it [the gun] around and opened on the enemy piece. Jackson's action seemed hopelessly foolhardy. Although he set an example of coolness, walking up and down the road, ignoring the fire, while all of his men except one sergeant ran for cover in the ditch. Jackson rushed to the gun and, with his sergeant helping him to serve it, carried on the fire against the Mexicans.

General Worth ordered him to retire, but Jackson sent back word that with 50 men he could capture the breastwork. At this moment, Captain Magruder arrived with the remainder of the battery; and, as the increased fire beat down the Mexican outburst, the infantry charged and smothered all resistance.

With the fall of Chapultepec, the battle shifted to Mexico City. Artillery exploits marked the fight for entry into the city. Captain Duncan's battery accompanied the column toward the San Cosme gate; Captain Drum's battery supported the attack on the Belen gate; Captain Steptoe and Captain Taylor's batteries continued to threaten the La Piedad approach to hold cannon and defenders in position there.

When General Quitman's division was stopped by cannon fire, Duncan, under Worth's control, sent a section under Lieutenant Henry Hunt into a position

400 yards from the enemy to eliminate the resistance. This unexpected help enabled Quitman to advance; with mission accomplished, Hunt's section returned to its parent unit. Captain Drum's battery continued to accompany Quitman's infantry. The artillery had to stay on the road, while the infantry had relative protection in the ditches and under the arches of an overhead aqueduct. Slugging it out on an open road with opposing emplaced artillery was a test of courage for the battery. Twice the unit had to call for replacements from close-by infantry troops; Captain Drum and Lieutenant Benjamin were both killed; and Lieutenant Porter, the third in command, was wounded. By nightfall, Quitman's force had reached the vicinity of the Citadel. With artillery resupply possible only at night. Quitman waited for dawn to subdue the last obstacle.

General Worth's progress was stubbornly opposed. Two mountain howitzers were stationed in church steeples by Infantry Lieutenant U.S. Grant and Navy Lieutenant Raphael Semmes (future Civil War heroes), which enabled their supported unit to reach an abandoned battery position. Then, according to the historical record:

A most dangerous service was now required to be executed. This was the advance of a piece of artillery to the evacuated battery in the face of direct fire from the garita. This duty fell upon Lieutenant Hunt and was performed with a gallantry that extorted the admiration of all who witnessed it. Followed by nine men, he traversed with his piece a distance of 150 yards; and, though moving at full speed, he lost — in killed and wounded — five of his command. With the remaining four he met the enemy at the breastworks, muzzle to muzzle, conquered his position, and successfully opened a fire upon the garita and the intermediate force of infantry.

Of this exploit, General Worth wrote: "It has never been my fortune to witness a more brilliant exhibition of courage and conduct."

When Captain Huger moved a 24-pounder and a 10-inch mortar to the San Cosme garita and fired three shots from the gun and five from the mortar as a warning to the defenders and to the populace of the destructive barrage to follow, the soldiers in the capital city surrendered. A great victory against heroic odds had taken place; and the heroic exploits of Redlegs such as Judd,

Stephoe, Magruder, Jackson, Drum, Benjamin, Taylor, Porter, and Hunt showed the courage and determination that permeated the artillermen of that day.

Holding Fort Pickens



In 1860, Lieutenant Adam Slemmer was an assistant professor of mathematics at the United States Military Academy. A cadet found him to be

. . . a solemn, hollow-eyed, spare man, who wore glasses and looked at us, standing there before him in the middle of the floor reciting, as if he were studying and trying to interpret an omen. None ever credited him with being a hero, so mild and meditative was his manner. . . .

In 1861, however, when Major Robert Anderson was defending Fort Sumter, Lieutenant Adam Slemmer duplicated and even exceeded Anderson's daring achievement in his defense of Fort Pickens, which controlled access to the Pensacola harbor in Florida.

Fort Pickens was on the extremity of the long, low, sandy Santa Rosa Island, which stretched eastward and formed an excellent breakwater to the Pensacola bay. In early 1861, a small military force stationed in the bay area was in charge of three forts: Fort McRae, on the mainland, with a lagoon behind it, guarded one side of the harbor; Fort Barrancas faced the entrance of the harbor; and Fort Pickens was on the east side of the harbor entrance. The navy yard was about a mile inside the bay beyond Fort Barrancas.

The first shot of the Civil War was probably fired at Fort Barrancas on 8 January 1861. Lieutenant Slemmer, third in command,

was then commander of Company G, 1st Artillery, since the commanding officer and the second in command, both Southern-inclined, were on detached duty. He decided to move his unit secretly, without orders, from its exposed position to the comparative safety of Fort Barrancas. That night, 20 Southern sympathizers, unaware of the move, approached Fort Barrancas with the intention of occupying it for the South. Their approach, detected by alert sentries, was repelled by fire from Lieutenant Slemmer's guns.

When Slemmer received word from General Winfield Scott to protect the Federal property in Pensacola, he determined that Fort Pickens was his best hope for survival. He contacted the commander of the navy yard and requested use of the vessel *Wyandotte* to move his troops. He completed the move two days after Florida seceded from the Union.

On that same day, the navy yard personnel capitulated. Florida troops occupied Forts Barrancas and McRae, lowered the Stars and Stripes, and substituted the Florida flag. In defiance, to let everyone know that Fort Pickens was still in Federal control, Slemmer hung the American flag over the northwest bastion. Not a man of Company G deserted — they showed tremendous loyalty to Slemmer and their country because their families and personal possessions were left behind in the enemy's hands.

When four intruders presented themselves at the gate of Fort Pickens and demanded, in the names of the governors of Florida and Alabama, a peaceable surrender of the fort, Slemmer's reply was haughty: "I know neither of them, and I mean to say they are nothing to me."

When Colonel W.H. Chase, commander of the enemy's forces at Pensacola, asked for an interview and requested the surrender of the fort, Slemmer read the terms of surrender, conferred with the captains of the two Union vessels in the vicinity, and then defiantly rejected the request.

During President Buchanan's administration, there was some hesitation to reinforce Fort Sumter, but not Fort Pickens. Captain Vogdes' artillery company was sent to the aid of Fort Pickens; however, officials with Southern loyalty learned of the expedition and notified the Southern state governors. A compromise solution ensued; if the artillery company did not land, the Florida and Alabama troops would not attack the fort. For approximately three months, this impasse existed while the artillery unit remained aboard ship off

Pensacola waters. Meanwhile, Slemmer's men worked 16 to 18 hours a day building the fort's defenses, which had been allowed to deteriorate since the Mexican War.

The Confederates too were busy, rehabilitating Forts McRae and Barrancas and preparing for a grand assault on Fort Pickens. Slemmer's 80 soldiers faced 800 to 900 confederate soldiers.

Shortly after the inauguration of Abraham Lincoln, General Winfield Scott, Army Chief of Staff, recommended to the new Chief Executive that both Forts Sumter and Pickens be evacuated. President Lincoln did not concur, and Captain Vogdes was ordered to land. Without opposition, his company of 86 artillermen (augmented by 115 marines) went ashore. Later, an additional force landed and raised the garrison strength to 880. Only then were Lieutenant Slemmer and his men of Company G, 1st Artillery, relieved. Exhausted from three months of arduous labor in preparation for and the daily strain of expected bloody battle, they departed Fort Pickens.

Slemmer had accomplished the same heroic moves that Anderson did at Fort Sumter and more — he succeeded in avoiding surrender. Rising to the rank of brigadier general by late 1862, he suffered wounds at the battle of Stone River which incapacitated him and eliminated any further opportunity for advancement. For one so uncomplimentarily described as "mild and meditative," Slemmer had shown that ". . . the outward man is no index of greatness of soul."

Gettysburg gunner



After the first day of battle at Gettysburg, General Hancock had this

to say about Lieutenant Alonzo Cushing, commander of Battery A of the 4th Artillery Regiment: "He is the bravest man I ever saw." That day the Union forces had been driven back upon Cemetery Ridge in a state of great confusion. Passing the position of Battery A, General Hancock summoned Cushing to accompany him and act as his aide. For 12 hours, the young artilleryman dashed across the battlefield, carrying dispatches to danger spots, guiding newly-arrived reinforcements to designated defense positions, and performing whatever other dangerous duties General Hancock requested. No order was too perilous; no duty was shirked. Greater deeds, however, were to be performed by this young man, age 23, in this memorable battle.

In June 1861, Alonzo Cushing joined the 4th Artillery. Although his demeanor was kind and his smile was warm, his trademark was the strict discipline he brought to the task of teaching raw recruits in the skills of field artillery. This approach to training proved immediately invaluable; for in July his battery found itself at Blackburn's Ford, near the Stone Bridge over Bull Run. The 4th Artillery fired the first Union shot of that battle. On the third day of the Bull Run conflict, Alonzo's battery, like most other Union units, joined the precipitate retreat to Washington; unlike many other Federal units, however, his battery retired in good order. Near Fairfax Court House, Cushing's unit and two likewise disciplined infantry regiments reconnoitered and reported that the Confederates had given up pursuit. As one volunteer wrote of the disorderly retreat, "One battery was distinguished for its fine appearance . . . that was Battery A of the 4th Artillery. Cushing was in command. . . ."

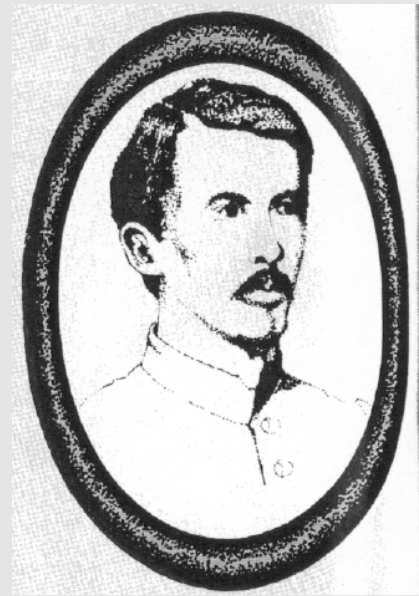
Cushing's enthusiasm for battle showed in the Peninsular Campaign. For example, at Williamsburg, where he continually stayed up front, he had a horse shot from under him; and, while he fought at Fair Oaks, a minie ball struck him on the chest, but a dispatch book prevented its penetration. At Glendale and Malvern Hill, he again had horses shot out from under him. At Fredericksburg, General Darius Couch, impressed by Cushing's disregard of personal safety in delivering dispatches to all parts of the battlefield while acting as his aide, reported: "Lieutenant Cushing was with me throughout the battle and acted with his well-known gallantry." At Chancellorsville, back with Battery A of the

4th, Cushing fought strongly in a losing battle; in the subsequent retreat, his unit was the last to cross the Rappahannock before the Confederate advance.

As stated earlier, Alonzo Cushing was chosen by General Hancock to become his aide for the day. On the second day he reverted to his battery command; little action occurred in their area of defense.

On the third day of the battle at Gettysburg, Cushing was back with A Battery. The last desperate charge of the Confederates took place with the famed Pickett's Charge; Cemetery Ridge was the target. For two hours cannon on both sides thundered. Battery A was in the forefront of battle. Enemy bombardment blew up three limbers, shot off six wheels from the guns, and disabled six horses. Alonzo had both thighs torn open by a cannon ball, but he refused retirement from the exposed position: "I will stay here and fight it out." Eventually General Hunt, in charge of the Federal guns, ordered the artillery to cease firing and conserve ammunition to await the infantry attack. The Confederates, misinterpreting the respite as a sign of the effectiveness of their cannonade, ordered the advance. Battery A, with only one gun in working order, moved forward to meet the threat. The gun was double-shotted with canister. Cushing hobbled along and at 400 yards commenced fire. The enemy kept coming. At 200 yards, the gun was triple-shotted. Still the enemy came. A bullet struck Cushing in the stomach. Sergeant Fuger wanted to send him to the rear. "There's no time, Fuger," Cushing retorted, "I'll stay right here and fight it out, or die in the attempt." One last shot remained in the gun. To General Webb, standing nearby, Cushing said: "I'll give them one more shot, Webb." Then, just before a bullet struck him in the mouth, he said, "Goodbye, Webb," and was forever silenced. Sergeant Fuger fired the last shot. The Union infantry counterattacked. The Confederates were stopped at the cannon's mouth, and they began to retreat. General Armistead, the Confederate leader of the foremost unit, fell at the gun site. Captain Hazard, commander of General Hancock's II Corps artillery, officially reported: "Cushing especially distinguished himself for his extreme gallantry and bravery, his courage and ability, and his love for his profession. His untimely death and the loss of such a promise as his youth cherished are sincerely mourned."

A stand at Cedar Creek



DuPont Code of Honor

Promise that you will never give away to anger and still less to hatred to such a degree that you will shed the blood of any man unless you are too constrained by the most absolute necessity. But promise at the same time that you will not allow yourself to be cowed by any danger when you are called upon to defend your country, or your wife, or your children, or your brother, or yourself, or any other human being who, in danger not deserved by his own wrong doing, has need of your help.

First Lieutenant Henry A. DuPont, 5th Artillery Regiment, received his first taste of combat in the valley of the Shenandoah in 1864. It was a true test of courage and leadership. General Sigel, meeting the Confederate column of General Breckenridge in New Market, brought forward his units piecemeal — a tactical mistake. General Sullivan's reserve division, to which DuPont's battery was attached, arrived at the scene of battle just as the Southerners were successfully overrunning Union forward lines and Sigel's troops were retiring in panic. For the Confederates, it looked like a total victory; behind the demoralized foe

was just one means of escape — a bridge.

Sizing up the desperate dilemma of his army, DuPont galloped his battery in front of the retreating infantry. As he himself said, "I had to depend upon myself." He knew his maneuver might cost his unit fatalities and perhaps the loss of a few guns, but protecting the Union retreat was more important. Cadet Captain B. A. Colonna, a VMI graduate and participant in that battle on the Confederate side, described best what DuPont accomplished:

We certainly expected at that time to capture a considerable portion of Sigel's army, for it was completely dispirited by bad management and making little or no resistance. . . . Suddenly we saw guns unlimber . . . and, in an instant, they began firing furiously. The service of these pieces reminded me of the drill of our [VMI] cadet battery — it was different from and very superior to the ordinary. The smoke from a few rounds added so much to the obscurity occasioned by the haze and hung so low that in a minute or so we could no longer see what was occurring on the pike, and our men in front halted until those in the rear came up. Perhaps it was 10 to 15 or maybe 20 minutes before our line was in condition to advance again. Just then the firing ceased and the smoke rolled away, and there were those two guns getting away to the northward . . . and the rear of Sigel's army had been saved by the superior management, valor, dash, and drill of what I now know was Light Battery B, Fifth US Artillery.

For outstanding success in his first battle, DuPont was promoted to Captain and made Chief of Artillery, Department of West Virginia.

Later, DuPont was promoted to colonel and was put in command of three batteries, which fought successfully in the battles of Piedmont, Lynchburg, Fisher's Hill, and Winchester; but it was at Cedar Creek that DuPont's heroism shone the brightest and earned him the Congressional Medal of Honor.

In the battle of Cedar Creek, Confederates commanded by General Jubal Early had, unnoticed, taken up flanking positions to the rear of Crook's 8th Corps (also called the Army of West Virginia). When the Confederates attacked, surprise was complete.

The men of Light Battery B were answering reveille call as the Confederate offensive hit. The guns of the Pennsylvania battery on the left were captured, although the cannoneers fought valiantly against overpowering odds. As Lieutenant Brewerton of that organization reported:

We were under a withering musketry fire, and as Colonel DuPont was the only mounted man on this part of the field and was riding a grey horse which made him very conspicuous, I expected to see him fall at every instant. But death was not to be his fate this day.

His instruction to the commanding officer of Battery B was to continue firing until he could see the enemy approaching through the fog and smoke. Then the guns were to be rolled by hand down the hill and there attached to the caisson limbers. DuPont's own description of the drivers hitching up the horses to the caisson limbers depicted the outstanding classic discipline of this Regular Army unit:

Although there was not a single commissioned officer in the ravine on duty, the drivers, in spite of a very heavy fire, were making extraordinary efforts to harness and hitch their horses, with the greatest possible dispatch. Everyone displayed the utmost calmness and courage, and there was not the slightest disorder or confusion. First Sergeant Webb was in command and was loyally assisted by Quartermaster Sergeant Sauthoff, Stable Sergeant Rodgers, and all the other noncommissioned officers of the battery. I have never seen a more striking illustration of the discipline and devotion of the patriotic soldiers of the Regular Army than was afforded on that day by the enlisted men of Light Battery B, Fifth US Artillery.

Going to his Ohio battery, DuPont informed the gunners to fire at the musket flashes of the enemy; and their fire temporarily stopped the forward movement of the Confederates. He stayed with the Ohio battery until it successfully retired. When General Crook appeared, DuPont requested permission to place his artillery in echelon along the turnpike, anticipating the continued Confederate threat down that road. General Crook agreed but promised no infantry support. DuPont moved the guns of the Ohio


battery and B Battery into position, and the ensuing firing helped bring the Union rout to a standstill.

About this time General Phil Sheridan appeared and regrouped the Union soldiers for an offensive. They attacked, and the tide of battle changed. DuPont, with nine guns under his control, galloped down the turnpike and set up a position overlooking the retreat of the enemy. The artillery fire broke up any semblance of order in the Confederate retrograde movement. Of DuPont's actions in the battle, Lieutenant H. F. Brewerton of B Battery remembered that:

It was . . . DuPont's heroic bearing and distinguished gallantry at the critical moment, when infantry support wavered and all seemed lost, which inspired the cannoneers and encouraged them to stubbornly hold their ground; and there is not the slightest doubt in my mind that, but for his prompt and skillful dispositions and imperturbable coolness and gallantry, nearly the whole of Crook's Corps would have been captured by the enemy.

DuPont's Congressional Medal of Honor citation mirrors Brewerton's words. His courage and quick-thinking saved the day at Cedar Creek.

Conclusion

The Field Artillery has never lacked for the type of leaders who can summon up special reserves of courage and ingenuity. The tradition lives on only because Redlegs of each new generation take the time to see through the smoke of distant fires to the secrets of artillerists of the past. 

COL (Ret) Robert M. Stegmaier received his commission in the Quartermaster branch upon graduation from the US Military Academy in 1937. During his tenure as a quartermaster officer, he served in Germany, Korea, Peru, and the United States. He served as the commanding officer of the 32d Quartermaster Group from 1954-55 and the 2d Quartermaster Group in 1960. He retired at Fort Sill in 1965 and upon his retirement adopted the Field Artillery. He has published articles on famous field artillerymen in the *Kansas Journal*, the *West Point Assembly*, and the *Field Artillery Journal*. Currently, he resides in Sun City, Arizona.

Right by Piece

NOTES FROM UNITS



Lance Corporal Ronald Davis breaks out the powder for one of the last 175-mm rounds fired.

Last 175-mm gun battery

TWENTYNINE PALMS, CA — The last 175-mm gun battery on active duty — the 3d 175-mm Gun Battery (SP), 4th Battalion, 11th Marines — was retubed to 8-inch and redesignated to 3d 8-inch Howitzer Battery (SP) on 28 November 1983. The event occurred during a short ceremony in the Delta Corridor on board the Marine Corps Air Ground Combat Center, Twentynine Palms, California. The final portion of the ceremony consisted of firing the last four 175-mm rounds on hand. (1st LT C.G. Ikins)

Springex '83

HOHENFELS, GERMANY — Soldiers from the 1st Battalion, 22d Field Artillery, 1st Armored Division, had an opportunity to refine their skills in both NATO interoperability and joint German/American operations. During Springex '83, a field training exercise at the Hohenfels training area in Germany, the 1-22d FA and the German Panzer Artillerie Battalion 125 (a 155-mm, self-propelled unit organic to Panzer Brigade 12, 4th German Mechanized Infantry Division), jointly planned and conducted combined arms, multinational operations in direct support of the 2d Brigade of the 1st Armored Division.

The joint training consisted of a one-day 14.5-mm subcaliber fire exercise followed by a two-day command post exercise. For the 14.5-mm training, the German battalion provided and manned six 14.5-mm subcaliber devices, each simulating a firing battery which was manned by German personnel. The US fire direction center (FDC) computed firing data for its three "batteries." Throughout the exercise, FIST chiefs and observers of both nations called in fires to their own FDCs and to the FDCs of the other nation using the other unit's language and communication equipment. This setup provided an excellent opportunity for the FDCs, liaison teams, FIST chiefs, and forward observers

to exercise a system of fire support coordination. Using a common boundary scenario throughout the exercise, the two battalions wrestled with the problem of coordinating fire support for the attack of enemy targets both on the common boundary and in the other nation's sector. The fire support coordinators quickly discovered the necessity of early cross-attachment of liaison personnel. Each battalion provided a liaison team to the other battalion's fire direction/tactical operations center. A typical liaison team from the 1-22d FA consisted of a German-speaking officer (lieutenant or captain), a German-speaking noncommissioned officer, a driver, and a 1/4-ton vehicle with two FM secure capabilities, two OE-254 antennas, and one AN/PRC-77 radio set with secure capability. Each battalion's liaison officer coordinated artillery fires on and across the common boundary and garnered all available information on the friendly and enemy situations in the adjacent maneuver sector. It became clear that timely and accurate cross-border coordination depended on the field artillery battalion in sector quickly clearing all fires for the requesting field artillery battalion.

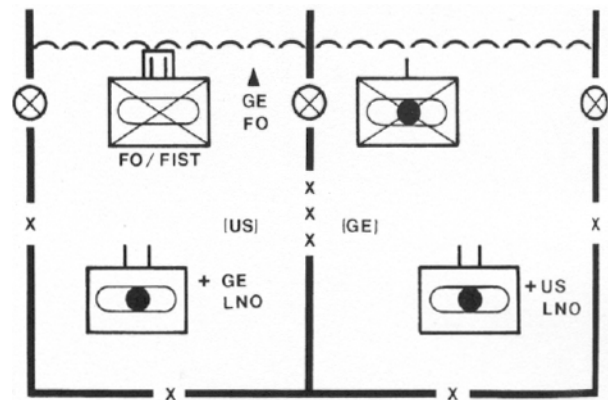


Figure 1. The common boundary scenario.

As an example of this process of cross-border coordination, here are two situations faced by the 1-22d and Panzer Artillerie Battalion 125.

- **Situation 1:** An enemy tank platoon moved from the US area of responsibility (the western sector in figure 1) into the German area of responsibility in the eastern sector. The forward observer for the US mechanized heavy task force on the extreme right of the US brigade sent a request to his direct support battalion FDC to neutralize the group of tanks. Liaison teams had previously been exchanged and were in position with their host battalion's tactical operations center, and so the direct support battalion S3 had two ways to coordinate the target attack with the flank German battalion. He could transmit his request for fire support coordination either through

the German liaison officer at his location or through the US liaison officer at the German field artillery operations van. (It proved easier for the S3 to coordinate with the German liaison officer at his location and have the German liaison officer transmit the request to his parent unit.) The German battalion then conducted the appropriate coordination and gave the US field artillery battalion permission to shoot across the multinational boundary. In some cases, depending on the nature of the target, both battalions massed appropriate fires on the enemy target by using a time-on-target technique. Additionally, the German battalion attached a forward observer party with an English-speaking officer to the US mechanized heavy task force nearest the multinational boundary. The German forward observer party occupied a relatively static position with excellent fields of observation and then contacted the US fire support officer or FIST chief. The German forward observer transmitted the request for cross-boundary fire and possible additional fires directly to the German tactical operations center; the US direct support battalion received an information message from the task force support officer. When this procedure was well-coordinated, it provided the most timely means of cross-boundary fire support.

- **Situation 2:** The enemy tank platoon moved from the German area of responsibility back into the US area of responsibility. (Actions taken were similar to those noted in situation 1.) The German forward observer sent a call for fire to the German tactical operations center, which needed to obtain permission to shoot across the multinational boundary. There were three alternative ways of coordination. First, the German S3 could request coordination through the US liaison office at his location to the US direct support battalion tactical operations center. Second, the German tactical operations center could send its request to the German liaison officer at the US direct support tactical operations center who would pass it to the battalion S3 for action. Third, with a German forward observer attached to the flank US task force, the German S3 could call directly to him; and the German forward observer could ask the battalion fire support officer or FIST chief for permission to fire. The request for additional fires would be sent by the battalion fire support officer to the direct support battalion S3. If appropriate and previously coordinated, another method of coordination would be to furnish the battery commander of the most western German battery with a US secure radio and appropriate communications-electronics operation instructions (distributed earlier by the US liaison officer). The German battery commander could then call directly to the battalion fire support officer or FIST chief nearest to the common boundary for coordination and additional fires.

In either situation, the differences in language and equipment were overcome through training and cooperation. Springex '83 proved that one set of field artillery procedures can be shared efficiently by German and American units. (Major Steven G. Starner)



FORT ORD, CA — B Battery, 6th Battalion, 8th Field Artillery, won the Eighth Annual 7th Infantry Division Artillery Gillmore Cup Competition last fall at Camp Roberts, California. Here, Corporal Edward Hunt sights his initial deflection during a hipshoot. (Photo by John Spears)



PROVIDENCE, RI — A soldier from the 103d Field Artillery Brigade, Rhode Island Army National Guard, checks out the ammunition during a training exercise at Fort Drum, New York. During their two weeks of annual training at Fort Drum, the Redlegs practiced their skills over and over again. The field training culminated in a 36-hour field evaluation. (Photo by SP5 Arthur Rash)



The Gettysburg monument to Clark's Battery B. (Photo by George McDonald II)

Clark's Battery B

JERSEY CITY, NJ — A monument located in the Peach Orchard at the Gettysburg battlefield only tells part of the story. The front of the monument has this inscription:

Clark's Battery, Battery B, First New Jersey Artillery, fought here from 2 until 7 o'clock on July 2, 1863, firing 1300 rounds of ammunition. Losses: killed 1, wounded 16, missing 3.

The rear of the monument continues:

Mustered in September 3, 1861. Mustered out June 16, 1865. Engaged in 26 battles, including all the important actions on the Peninsula, Fredericksburg, and Appomattox.

The monument, erected by the State of New Jersey in 1888, still stands as a lasting tribute to the battery's fame, but here is the rest of the story.

At the onset of the Civil War, General Henry Hunt described the condition of the field artillery as "unsatisfactory" in an article in *Century Magazine*. Faced with a lack of adequate support from both Congress and the War Department, Hunt concluded that "many of the batteries attained a high degree of excellence, due mainly to the self-sacrifice, courage, and intelligence of their own officers and men."

Lincoln's call to arms in 1861 necessitated the formation

of regiments and batteries. So, in August of that year, on the streets of Newark, New Jersey, Assistant Foreman John E. Beam of Ladder 1, Newark Fire Department, became commander of Battery B, 1st New Jersey Light Artillery. There were five batteries in the Regiment, but Battery B became the most renowned.

Armed with four 10-pounder Parrott guns and two 12-pounder howitzers, Battery B was assigned to the defenses of Washington after leaving Trenton in September of 1861. The coming Peninsula campaign would change the Battery B leadership and give it the name that remains to this day. On 1 July 1862, Captain Beam was killed during the battle of Malvern Hill, one of the most famous examples of massed artillery fire during the Civil War. He died a year to the day before the battery's famous stand at the Peach Orchard at Gettysburg. The battery bugler, Joseph Steventon, describes the incident:

We were on the rear guard. . . the Captain stood by his horse, which I was holding as I sat on my own. A shell burst almost on his breast, tearing his left side off and throwing his left arm off at least 30 feet from his body where I found it one hour after it killed him instantly . . . he was facing the enemy when struck.

Following Beam's death, Lieutenant A. Judson Clark became commander and was promoted to captain. He led the battery through its many campaigns, but it was a hot July day in Gettysburg when the battery had its finest hour as part of Sickles' Third Corps Artillery in the defense of the Peach Orchard.

The action opened at 1,400 yards; and, as usual, the tactics were antipersonnel and not counterbattery fire. Battery B was located in a hollow just over a rise, and its guns were in view of the oncoming infantry for the last 200 yards. The guns fired 1,342 rounds in a five-hour period — one round per gun, every 80 seconds. One of the 10-pounder Parrotts blew a vent during the battle; and so, to the battery front, there was a fire blazing continuously on shells, case shot, and canister. The battery loss was 1 killed, 16 wounded, and 3 captured. Only one caisson and one caisson body were lost on the field.

Following the Gettysburg Campaign, the battery was refitted with 12-pounder Napoleons, which it used for the remainder of the War. Captain Clark and his battery served with distinction in the remainder of the engagements with the Army of the Potomac. Clark received his brevet major for directing the battery at Sailor's Creek on 5 April 1865. These activities resulted in the capture of 400 Confederate wagons, 1,700 prisoners, and 5 artillery pieces. The battery was mustered out on 16 June 1865 following the Grand Review in Washington on 23 May 1865.

After the War, Clark became the police chief of Newark, New Jersey. His record and that of his battery were not to be forgotten, however; for not 50 years after his death in 1913 and only 18 years after the death of the last surviving member of the battery, Noah Woodruff and a group of enthusiasts and historians formed in 1958 what has today become the finest recreated artillery unit on the east coast.



Clark's Battery B 12-pounder Parrott in action. (Photo by G. Drake)

The Battery B of today is much like the unit of 1861 and is equipped with an original 3-inch Parrott rifle. The unit is a member of the North-South Skirmish Association, an organization designed to perpetuate the lifestyle of the enlisted soldier of the Civil War through participation in competitive shooting events called skirmishes. These events include artillery matches during which the Parrott is fired at 6-inch tiles at 100 yards and 24-inch artillery targets at 200 yards. As opposed to the original ten-pound projectile and one-pound powder charge, the Association rules allow a six-pound shell and a five-ounce powder charge in the interest of safety. Members of the battery manufacture their own shells. The battery has won four first-place awards in the Association National event, as well as many placings at local and regional competitive matches.

Practice drills are essential for a smoothly functioning artillery crew. All crewmembers are schooled in each of the respective positions of the nine-man crew.

Battery B participates in a variety of historical events, including living history programs, parades, reenactments, displays, and lectures. Uniforms and equipment (even eyeglasses and sunglasses) are carefully selected to ensure that everything conforms to Civil War style. Battery B has made two records of battle sounds, one released by Mercury and called the *Civil War* and the other released by Riverside records. The battery's members have been regular participants in the Fort Dix Saint Barbara's Day Ball. At Fort Hamilton, New York, the battery has fired its Parrott gun for the retreat ceremonies honoring the birthday of the fort and for the opening of the Harbor Defense Museum. Battery B is a charter affiliate of the Fort Hamilton Historical Society and dedicated the 24-pounder flank howitzer installed in the museum in June of 1983.

Today's artillerymen of Clark's Battery B have not forgotten the spirit of their predecessors. The patriotism lives on. (George McDonald II, commander of Clark's Battery B)

Arkansas NG FIST goes to Fort Campbell

FORT CAMPBELL, KY — A 13-man fire support team (FIST) from the 5th Battalion, 206th Field Artillery, 39th Infantry Brigade (Separate), Arkansas Army National Guard, recently participated in a week long field training exercise at Fort Campbell, Kentucky, with the 1st Brigade, 101st Airborne Division (Air Assault). The team provided the organic fire support for the 1st Battalion, 327th Infantry, which was conducting an external ARTEP. FIST personnel were responsible for fire support

coordination of artillery fires, mortar fires, Cobra gunship strikes, and close airstrikes of A-10 attack aircraft.

The field training exercise was the first exercise in which members of the 5-206th FA have acted as the organic fire support element for an Active Army unit. This training with the Active Army unit provided the team with the opportunity to gain additional knowledge and to exercise skills of the team members. A very good working relationship was established between the FIST personnel and the infantrymen of the 327th and strengthened the "One Army" concept between the two units. (Captan Ralph L. Ledgerwood)



California National Guard CH-47 helicopters, flown by pilots from the 49th Transportation Company (Medium), airlifted 2-218th FA howitzers from Fort Roberts to the exercise area.

Portland Light Artillery

PORTLAND, OR — In 1977, the 41st Infantry Brigade became the roundout brigade assigned to the 7th Infantry Division; and the 2-218th FA, the Brigade's 105-mm towed direct support artillery, became part of the 7th Infantry Division Artillery. Last summer the 2d Battalion, 218th Field Artillery, traveled 900 miles from Portland, Oregon, to Fort Roberts, California, to participate in Celtic Cross I, a field training exercise of the 7th Infantry Division. Celtic Cross I marked the first time that the 7th Infantry Division had all of its brigades under unified command for a single field training exercise.

The 2-218th used Celtic Cross I to train on initial mobilization, load plans, convoy movement, fire support, air movement operations, and familiarization with the M198 155-mm towed howitzers to which the battalion will convert in late 1984. Fire support teams participated at maneuver unit level and, for the first time while on the move with those units, called for fires in support of the attack. The air movement training, for which gun crews had practiced sling operations throughout the training year, resulted in the first airlift of the battalion's weapons since 1975.

Formed in 1866 as the Portland Light Artillery, the 2-218th Field Artillery has been armed with various weapons systems over the years — the 6-pound field cannon, the French 75, the 155-mm Schneider, the 155-mm Long Tom, the 8-inch towed, the Honest John, the 155-mm towed, and soon the M198 155-mm towed. The battalion looks forward to the continuing challenges of its roundout mission. Business is booming in Portland. (MAJ W.C. Weintritt)

Terrain walk

HERZOGENAURACH, WEST GERMANY — Units of the 210th Field Artillery Brigade, like those of most brigade-sized units in the Federal Republic of Germany, are stationed at three separate kasernes. The brigade headquarters and two battalions are stationed at Herzogenaurach; two other battalions are located elsewhere, one each in Nuremberg and Ansbach. As a result, very few brigade officers have the opportunity to meet one another, let alone develop any sort of corporate identity. To compensate for this separation and thereby increase the brigade's ability to function as a cohesive unit, the brigade commander, Colonel Jerome Granrud, looked for opportunities for what may be characterized as "shared professional experiences." Thus, in the spring of 1983, he tasked one of his battalion commanders to conduct a tour of the Blenheim battlefield area for the officers of the brigade to enliven officer professional development programs and to build unit cohesion.

The value of the battlefield tour as a vehicle for an officer's professional development belongs more to the realm of theory than it does doctrine. Doctrine, which is taught in military schools, tends to be the application of abstract ideas about how a war should be fought with existing or envisioned means; in other words, doctrine is primarily a matter of technique which is reinforced in the field by terrain walks, war games, and maneuvers. Military theory is an abstract belief system based on the historical study of military operations and tactics. It may be clarified by historically based war games and the battlefield tour, which is no more than a terrain walk in history. Maneuver units in Germany use the terrain walk as a planning and instructional vehicle. They go to the terrain they will defend in war and apply to it the known capabilities of contemporary weapons and their speculations about what the enemy can and will do.

The battlefield tour is a terrain walk into the past rather than the future. Here one sees the terrain, knows the capabilities of weapons, and knows how these weapons were employed. In the terrain walk, the goal is to predict a *likely* sequence of events, whereas in the battlefield tour one seeks to understand why a *particular* flow of events resulted from the correlation of opposing forces at a particular time and place.

The Battle of Blenheim was of great importance in its day. In the early morning hours of 13 August 1704, 52,000 soldiers of the Grand Alliance came down the Donauworth Road and surprised the 56,000 sleeping French and Bavarian soldiers who were encamped on the fields and in the villages northeast of the Bavarian town of Hochstadt. The Grand Alliance thereby destroyed French hopes of driving Austria from the War of the Spanish Succession.

The Blenheim battlefield was selected for study primarily for reasons of proximity. It lies on the Donau (Danube) southwest of Donauworth, about two hours' drive from the farthest brigade unit. The box-shaped, compact battlefield, measuring approximately seven by nine kilometers, has remained relatively unchanged. The only major changes have to do with



History-hunters listen to expert tour guide.

drainage and a straightening of the Donau's main channel.

Like most USAREUR units, the 210th Field Artillery Brigade is always busy; so time was at a premium. Moreover, there was a problem of finding dates that were feasible for all battalions. These constraints had to be balanced against the requirement for adequate time to prepare the 90 or so officers for the tour and to cover the battlefield — 1 1/2 days were deemed adequate. The brigade commander decided to use a Friday afternoon and Saturday to minimize officers' absence from their units.

Since a certain amount of basic information is helpful before a tour, two introductory lectures were given to personnel, followed by a detailed discussion of early 18th century weapons, tactics, and drill. The officers were urged to use their imagination as well as their intellect "to see" the battle, to hear the cannonade and the screams of wounded men and animals, and to remember that visibility on a black-powder battlefield was limited and that command and control were more difficult, despite the compact size of the battlefield.

The touring officers were then separated into three groups, each headed by a volunteer guide who had made a detailed study of the battle. These guides, who were the keys to the success of the battlefield tour, had previously reconnoitered the battlefield area. They led their groups to the critical points on the battlefield and related events of the battle.

The tour of the battlefield itself took about five hours. The principal points of interest were the church tower at Tapfheim from which Marlborough and Eugene surveyed the battlefield the night before the battle; the hill beside Wolpertstettin where Marlborough and Eugene stopped for a final reconnaissance; and also Blindheim, the French position opposite Unterglau, Oberglau, and the area north of Lutzingen to Oberglau where Eugene fought Marsin and the Elector. The cliffs at Sonderheim, over which the retreating French are said to have ridden into the Donau, were another point of interest. By walking the ground, officers accustomed to thinking of

warfare in thousands of meters got a feel for war conducted at an interval of yards and saw the advantage that a few meters could give an enemy on horseback. The extremes of this field, which on that day in 1704 held more than 100,000 combatants, are visible from the center of the field at points on either side. It is wide enough and clear enough to maneuver formations of cavalry and closely aligned infantry. It even permitted the movement of cannon in support of Marlborough's attack.

To further the social goal of the exercise, lectures were held in a gasthaus after dinner. The brigade commander had directed a mixed battalion seating arrangement by grade (the billeting and tour groups were divided along similar lines). Officers were thus thrown together with their peers from sister units, rather than being permitted to adhere to their natural battalion groupings.

As a cohesion builder, the Blenheim Battlefield Tour was an immediate success as indicated by the noise level at each dinner table that evening; the collective participation in the discussion of the various facets of the battle throughout the day and a half and inquiries from officers about more such tours are evidence that the social goal was achieved. Judging the success of the intellectual goals is more difficult and necessarily entirely subjective. Officers participating in a blind survey after the tour indicated that they felt the time was well spent and professionally rewarding. A majority indicated that their interest in history had been awakened, and some have pursued additional reading on Marlborough as a consequence. One battlefield tour, however, no more produces a theory of war than it develops a cohesive combat unit. The real benefit will only be known in the future. The best that can be hoped is that the seed of interest was planted in some of the officers present — that someday that seed will blossom into a complete and coherent theory of war.

Although a battle may be studied from books and maps, a dimension of understanding is added for those who have walked the ground. (LTC Richard M. Swain)



BERGEN HOHNE, WEST GERMANY — During a two-day Army Training and Evaluation Program, Battery C, 94th Field Artillery, evaluated the proficiency of the firing battery, fire direction center, and forward observers. Here, the battery's M109 self-propelled 155-mm howitzers leave a trail of dust as they maneuver in Barbaradorf, a mock village in the Bergen Hohne training area. (Photo by Doris Flack)

Redlegs in El Salvador

EL SALVADOR — After receiving eight days — 15 hours a day — of continuous training from the Artillery Mobile Training Team from Fort Sill, the Salvadoran cannons of the 2d Battery, 2d Battalion,



The artillerymen of El Salvador are equipped with (from top to bottom) the Yugoslavian M56 105-mm howitzer (1950 vintage), the US M101 M2A2 105-mm howitzer (1950 vintage), the Pack 75-mm howitzer (not just for salutes), and the US M102A1 105-mm howitzer.

stationed in San Juan Opico, fired the first rounds from their M102A1s. Over 30 officers and 400 enlisted men were trained. Within the 24-hour period following the firing, two batteries were deployed and engaged guerrilla forces in the San Vicente and Morazán Provinces. (Major Alfredo Valenzuela)



CAMP SENDAI, JAPAN — Brigadier General James M. Miller, commander of the XI Corps Artillery, and members of his staff attend a briefing with Colonel Ohshima, commander of a Japan Ground Self-Defense field artillery group, during exercise Yasa Kura V. (Photo by CPT Nobuhiko Satoh)



FORT SILL, OK — Sergeant Walter Woodward, who is an assistant crew chief with the 1st Battalion, 12th Field Artillery (Lance), keeps his guard up as a Chinook helicopter leaves his platoon near Rabbit Hill during air movement exercises at Fort Sill. Seven firing platoons from the 1-12th FA rotated through the week-long training. The platoons met crews from the 178th Aviation Company near the III Corps Artillery area and rigged and loaded the Lance equipment on helicopters which carried them to the Rabbit Hill area. Soldiers set up perimeter guard and went through fire missions with the practice missile. (Photo by SP5 Mike Howard)

MOUT exercise

BERLIN, WEST GERMANY — The Redlegs of C Battery, 1st Battalion, 22d Field Artillery, are accustomed to doing the unusual (such as participating in a howitzer pull in England), but the 30 days they spent in Berlin represented a whole new experience. They were replacing the Redlegs of C Battery, 94th Artillery, from the Berlin Brigade so that the Berlin Brigade soldiers could participate in an Army Training and Evaluation Program at the Grafenwoehr training area.

After rail-loading their six howitzers, six M548s, three 2 1/2-ton trucks, two Gama Goats, a 5-ton truck, and an M577 track (fire direction center), the 1-22d FA soldiers set up at a local training area. During three days of training there, the soldiers conducted their own battery missions and had a howitzer section competition. Six different stations were run by the section chiefs. The stations included direct and indirect fire, preparing for deliberate and hasty occupations, preparation of DA Form 2404, care and handling of ammunition, and assembly and disassembly of the M16 rifle and .50-caliber machinegun.

A competition was also held on the 14-station confidence course, which was a "real killer" according to one of the cannon crewmen. "The hardest part was climbing straight up 10 feet of rope and back down. But it was fun, too," he said.

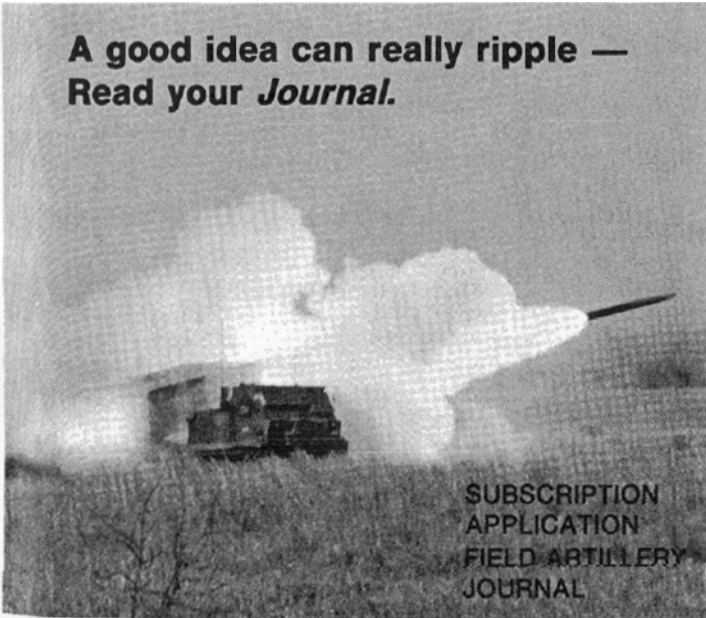
In a mock town known as Doughboy City, the 1-22d FA Redlegs learned to sweep a city — going through and clearing the buildings of the enemy, covering each other, crawling low, and using hand grenades. It was a unique opportunity for the soldiers to receive training in military

operations in urban terrain (MOUT). The battery was split into two teams, and two NCOs from the Berlin Brigade walked both teams through the city. Then, while one team supported, the other went in.

The unit cross-trained with infantry personnel who showed the Redlegs how to use the Multiple Integrated Laser Engagement System. Rounding out the training for the Redlegs was instruction on the multipurpose individual observed fire trainer, the computerized M16 range, and skill qualification test requirements such as map reading, compass familiarization, and NBC and first aid procedures. (Becky Adams)



Private First Class Brandt Bersani of C Battery, 1st Battalion, 22d Field Artillery, mans a .50-caliber machinegun during gunnery practice at a local training area. (Photo by Jim Engstrom)



**A good idea can really ripple —
Read your *Journal*.**

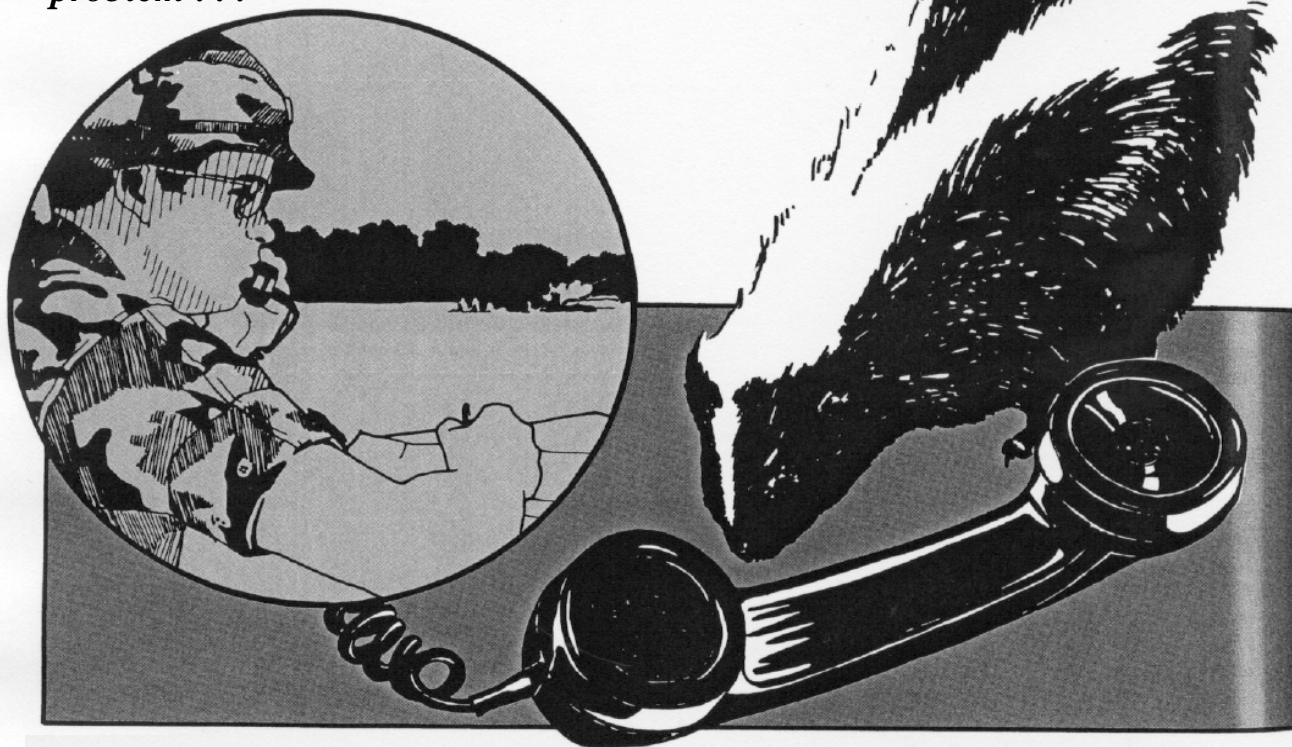
**SUBSCRIPTION
APPLICATION
FIELD ARTILLERY
JOURNAL**

Name (Last, First, MI)	Rank, Title	
Address		
City	State	
STATUS		
<input type="checkbox"/> US Army <input type="checkbox"/> US Marine Corps <input type="checkbox"/> Active Component <input type="checkbox"/> US Army Reserve <input type="checkbox"/> US Marine Corps Reserve <input type="checkbox"/> National Guard <input type="checkbox"/> Retired Military <input type="checkbox"/> Allied Military <input type="checkbox"/> Civilian <input type="checkbox"/> Industry/Office/Library <input type="checkbox"/> Other		
<input type="checkbox"/> I am a member of a certified US Field Artillery Association Local Chapter. The name of my local chapter is . . .		
Name		
Location		
RATES		
	US & APO Addresses	Foreign Addresses Except APO
1 Year	<input type="checkbox"/> \$14.00	<input type="checkbox"/> \$21.00
2 Years	<input type="checkbox"/> \$27.00	<input type="checkbox"/> \$41.00
3 Years	<input type="checkbox"/> \$40.00	<input type="checkbox"/> \$61.00
Signature	Date	
MAIL TO: US FIELD ARTILLERY ASSOCIATION P.O. BOX 33027 FORT SILL, OK 73503		

Common Scents

by Major Woodrow W. Harrison

... a skunkworks is a slightly "smelly" way of doing things; an unorthodox approach to a problem ...



If BATTLEKING is a skunkworks, what in the world is a skunkworks? Well, a skunkworks is a slightly "smelly" way of doing things; an unorthodox approach to a problem; and a deviation from the School solution. It is a direct link from the user straight back to the home of the Field Artillery. It is a streamlined process to get better ideas and material out of the think tanks, laboratories, and proving grounds into the hands of the user where they belong. And even though the Field Artillery skunkworks has only been

operational since September 1983, it has already proved to be a highly successful way of cutting through red tape to get quick fixes, product improvements, and state-of-the-art technology into the field — fast! The BATTLEKING program recognizes the common sense in the skunkworks' common scents. Here is how it came to be and how it works.

Why BATTLEKING?

A perfectly normal response to a new program such as BATTLEKING is a challenge of its necessity: "Oh no, not

another new program! Why do we need it? We already have product improvement programs. We are already in the process of developing and procuring new systems. We already have agencies which spend millions of dollars and countless man-years specifically for these purposes. So what is all this fuss about BATTLEKING?" Well, BATTLEKING is all about saving time, money, and effort by dramatically speeding up the process known as the procurement cycle, which is the complex, expensive, time-intensive way the Army gets its new systems.

Because everything is programmed out very neatly and scientifically into a series of phases, each of which is separate but is interrelated with the others and all of which require much effort by many different agencies, it generally takes *years* to get an idea from the drawing board into the hands of the user. This process starts with the perception of a need for something new, which is normally based on some newly discovered threat or on information that a known threat force may be up to something which will put it ahead of friendly forces unless they can counter it. This perception leads to a Military Element Needs Statement, which is then translated into documented requirements. The requirements generate contracts; contracts result in the production of prototypes; prototypes undergo testing; testing results (one hopes) in type classification; and, ultimately, there is the fielding of the new system. This simplification does not mention stumbling blocks such as funding tug-of-wars on Capitol Hill, changes in high-level strategy, mid-program budget cuts, sudden technological breakthroughs, or subsequently discovered threat capabilities which may render the concept obsolete even before it is materialized.

Each of the life cycle phases has its own complexities. The testing process, for example, is long and involved. It starts in a sterile environment with developmental experimentation and ends in full-blown operational testing in which the intended user puts a system through its motions in an environment which simulates its ultimate application. Before testing can be initiated, there are issues to develop, resources to allocate, and times and places and units to coordinate. New equipment training must occur and be based, of course, on programs of instruction developed by the proponent service school in conjunction with the contractor. If it sounds complicated, it is. There is much more involved, but this brief description shows the time and effort involved in testing a new item to ensure that it does what it is supposed to do.

But of all the phases, the first phase is the most time-consuming. Understanding what the requirements really are and then documenting them involves answering many, many questions. For what system is there a real need? How many of the system are needed? Who will use it and under what conditions? How will it be used? Does the system interface with other US or allied existing or future systems? How often does the system

break down? How does one fix it? Who should fix it? Is it cost-effective? And on and on. This laundry list of questions is by no means complete, but it does point out the primary difficulty with the current procurement process—before the need can be articulated to a contractor, it must be precisely understood by the user. In many cases, the Army is not quite sure of the exact dimensions of a need when it tries to fill that need; so it may ask the contractor to build something very specific. Then the designers do their thing, which may or may not satisfy the requirement. Then it is back and forth, until the matter is settled.

But perhaps this back-and-forth approach is backwards. Perhaps industry already has ideas or items which may be of significant military utility. Civilian technologists could very well be working on things which may have all kinds of military applications. Imagine the time, frustration, and money that could be saved if a setup existed whereby industry could bring in new gadgets and actually try them out in a military environment. Imagine an M109 howitzer dedicated solely to the purpose of, and readily available for, wild and crazy experiments for installing a widget, moving things around, or testing everything from track pads to fire control optics to communications. And, if something works or even looks promising, imagine the time that would be saved in documenting the requirements!

Now forget for a moment the cigar-smoking contractors and the smart generals and colonels and research experts and their futuristic "star wars" gadgetry. Imagine direct input from users in the field who must live (or die) with the items in the current inventory. They work around the problems on-the-spot with sometimes unauthorized, but effective modifications. Field expediency (the more palatable term for plain old GI ingenuity) abounds throughout the field. Somewhere out there, a seasoned chief of firing battery has discovered a better way to handle camouflage netting that may save other chiefs in other parts of the world a good deal of grief. Somewhere out there, a young mechanic has devised a small wire tool for checking the differential fluid level in the M562 Gama Goat instead of sticking in his finger. Somewhere out there, a unit S3 has a brainstorm about a better tactic for employing a cannon battalion. Simple ideas, yes, but why not share them with others? The Field Artillery Branch wants to get hold of these ideas, try them out, standardize them if they work, and share them with Redlegs the world over.

Finally, imagine the existence of several test beds, as they are called in the research and development community. A "test bed" approach can be explained through an analogy involving the development of a loading plan for a 2 1/2-ton truck. The "book" says that one should look at the dimensions of the space available inside the truck, examine what there is to put into it, analyze the weights and cubic volumes of the cargo items, multiply the number of items by the dimensional specifications, and then draw a schematic showing exactly what should go where. A much quicker way — the test bed way — is to throw the stuff into the truck, arrange it so that it fits, and then draw a picture of it. It is a short cut, it is certainly not the School solution, and it is open to much criticism from scientific-minded managers. But it works! And it saves time and frustration.

How BATTLEKING works

The Field Artillery's skunkworks is the program which allows those technologists and equipment users to talk directly to the Branch and thereby allow the Branch to get new systems and fix or upgrade old systems. It is really a simple process. The Chief of Field Artillery announced the program in September 1983 in a letter he sent to each major Army field artillery commander (Active and Reserve Components) throughout the world, and now more than 100 proposals have been received and are in the skunkworks.

One might assume that with a mission this important, BATTLEKING must have a large staff involved with lots of paperwork and bureaucracy. Wrong! Like any organization, BATTLEKING has a controlling headquarters where projects are approved or disapproved, resources (including funds) allocated, priorities set, and so on. But, in keeping with the overriding concept of "no red tape," this decision-making body is streamlined, consisting of only three members. It is called, simply, the executive committee and is chaired by a general officer, the Assistant Commandant of the Field Artillery School. The other two members are at the heart of field artillery research and development — the Director of Combat Developments and the President of the US Army Field Artillery Board. This committee has overall responsibility for the skunkworks and reviews each and every proposal that comes in, no matter how simple, expensive, outlandish, or even ridiculous some of them may seem at first inspection. The executive committee



"Skunkworkers" experiment on relocating the gun display unit on the M110 howitzer.

reports directly to the Chief of Field Artillery.

How do the proposals get to the executive committee? Who staffs them? There must be some bureaucracy somewhere! Yes, there is; but only as much as is absolutely required to handle the traffic. A small secretariat of three people receives and processes all BATTLEKING proposals. This focal point and global post office box for all BATTLEKING matters is the Field Artillery Board's Weapons Test Division. The two civilian specialists for field artillery and equipment team up with a military officer from the Directorate of Combat Developments' test branch to orchestrate the whole program. As proposals come in, each is assigned a file number, carefully reviewed for content, and subsequently categorized according to subject matter. At this point, a key aspect of the program is worth noting: its simplicity. The BATTLEKING secretariat does not concern itself with administrative technicalities. There is no specified format, no required number of copies, and no need for submission through channels. BATTLEKING wants ideas, portrayed in understandable terms. All proposals are handled in exactly the same manner — whether it is a billion-dollar electronics corporation that sends in blueprints for a new laser gun or a private first class cannoneer who describes on the back of a C-ration box how he keeps from slamming his fingers in the breech. The BATTLEKING secretariat accepts all proposals enthusiastically and immediately acknowledges receipt and thanks the submitter for the idea. Then the skunkworks starts to — well, work.

Once a proposal is logged in, numbered,

and generally classified, it is assigned to a particular agency within the Field Artillery Center or School for technical review. For example, if the idea is a new fire direction procedure, it goes to the Gunnery Department; if it has to do with survey, it goes to the Target Acquisition Department; and, if it is a training matter, it goes to the Training Center. Each and every directorate or department has a designated point of contact which is immediately responsive to the BATTLEKING secretariat. And, even though one agency is initially handed the "ball" for a given proposal, the skunkworks is a team effort. Before any idea goes to the executive committee for approval, it is thoroughly (but rapidly) staffed throughout the Center and School through an agency called the test advisory group. This group consists of the very cream of expertise and experience in the Field Artillery Branch. About a dozen senior officers, mostly colonels and senior civilians, get together in a conference room and brainstorm the proposals. Of course, this group does not convene for each separate submission. The secretariat prepares blocks of proposals by convening regular and frequent work group sessions with action officers from the various Center and School agencies. At these meetings, these "worker bees" are provided information packets and briefings on all current proposals, not just the ones for which their agency has been given proponency. Open discussion follows, and everybody gets filled in on all the particulars. Then they take the packets back to their respective bosses (the actual members of the test advisory group) to brief them and obtain guidance for staffing. When the

test advisory group actually convenes, all the members are up to speed on all the projects. Generally, one or two of the members of the executive committee attend the meetings of the test advisory group. Their attendance facilitates business, and the executive committee learns what to expect at the approval session. The meeting of the test advisory group is the key to the success of BATTLEKING — the merit and feasibility of each proposal is carefully weighed, and a "go" or "no-go" recommendation is reached. All the resource requirements are determined, support units are identified, conflicts are resolved, and a recommended test evaluation team is designated. No actual decisions are made by the test advisory group. All proposals are still presented to the executive committee for ultimate approval or disapproval. A "no-go" recommendation does not mean that a proposal is not a good idea; it may just be beyond the scope of BATTLEKING capabilities.

Once approved, a proposal is handed over to the designated test evaluation team for actual execution. This team is an ad-hoc group which is put together for a specific project. The size and life span of this group are determined by the nature of the task at hand, ranging from a one-man, one-hour demonstration of a new gadget to a large test spanning a period of many months. The team manages the evaluation, collects and analyzes the required data, and reports its finding to the executive committee.

BATTLEKING success stories

There are already some BATTLEKING success stories to report. For example, a field artillery captain sent in a copy of the published standardized loading plan for an M109 howitzer. This School solution tells where everything should be packed and carried for combat operations in the field. It is a very scientific, neatly done plan; and everything fits right into place. But all the troop gear is aboard the M548 ammunition carrier, which has a habit of breaking down, leaving the crew with no personal gear! The captain also enclosed a sketch of his unit's loading plan, which very thoroughly addressed the real-world situation, along with a suggestion that BATTLEKING give the idea a try and then consider rewriting the School solution. His proposal was evaluated by III Corps Artillery, and a revised loading plan is now being prepared by the School's Weapons Department. Another example is an idea submitted

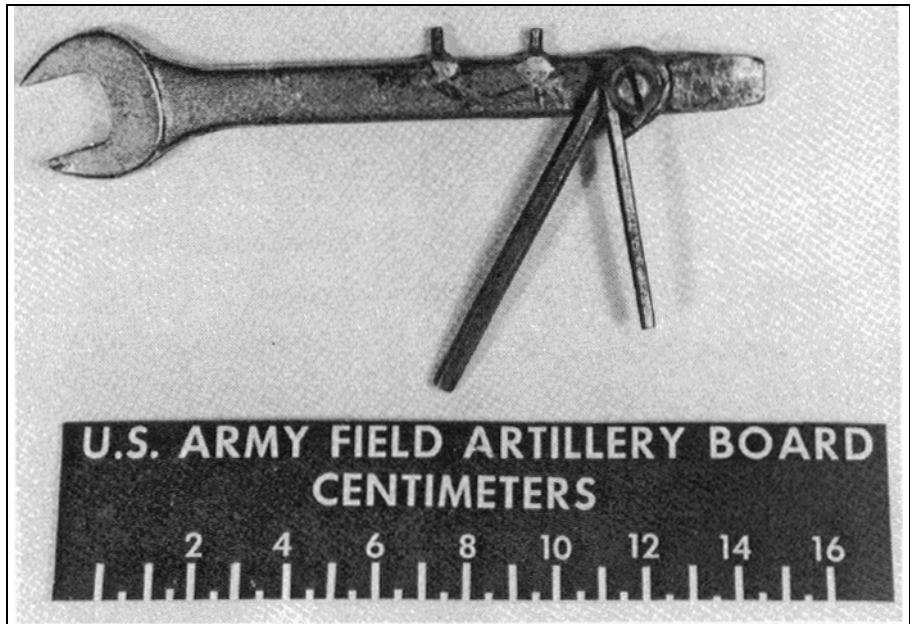
by a sergeant first class from the 1-13th FA at Fort Stewart. He proposed a modification to the engine stop cable on the M548. The cable currently runs through the instrument panel. It can come loose after a few hard pulls, sometimes causing the entire panel to come out and breaking one or more of the gauges. This clever noncommissioned officer figured out a way to reroute the cable and bring it up through the crew seat mount, which is of much harder construction than the thin instrument panel. His proposal also identified the M561 engine stop cable as a less expensive substitute. BATTLEKING validated this proposal and sent the evaluation results to the Tank-Automotive Command.

Ideas come from all over. The project manager for Cannon Artillery Weapons Systems, while considering options available to the Field Artillery Community for providing fire support to the light division, ran across the option of the baseplate howitzer. The concept was successfully demonstrated during the late 1960s, but never adopted. Since the baseplate howitzer is primarily a high-angle weapon, its stability at low-angle firings was a major area of concern. The project manager wanted to know if the baseplate howitzer could be fired at low-angle elevations (25 to 45 degrees). The answer was required in 30 days, and BATTLEKING provided it. An old XM193 baseplate howitzer was dusted off, Benet Weapons Laboratory made a few modifications to the baseplate, and the Field Artillery Board videotaped firings at various elevations.

Another idea which originated at the Field Artillery School is an alternate auxiliary power source for the M577 command post vehicle. A lieutenant colonel suggested the replacement of the noisy, heavy, unreliable 4.2-kilowatt generator with a 1.5-kilowatt or 3-kilowatt unit. This proposal is also under evaluation.

Industry has also submitted ideas, some of which include a two-axis wind sensor, an electronic azimuth and inclination measuring system, and a modular north-seeking system. The Field Artillery will be able to take a quick look at some pretty exotic gadgets (at no cost to the government) — thanks to BATTLEKING.

Other ideas in the "skunkworks" include determining the optimal interval for making zero velocity corrections to the position and azimuth determining system (PADS), substituting a small power supply for the BA-30 batteries currently used to power remoted



One implement performs the functions of five separate tools.

radios, and safety limit markers for M109 howitzers. One particularly ingenious device came in from a staff sergeant in the 1-129th FA, Missouri Army National Guard. It is a small wrench which has been modified so that it can now perform the functions of a 1/2-inch wrench, two hex wrenches, a spanner wrench, and a screwdriver — the firing lock on an M114 howitzer can now be repaired with a single tool rather than with five.

The Field Artillery now has a unique opportunity to grow and refine and mature as never before. BATTLEKING is the vehicle; but, like any vehicle, it requires fuel. The skunkworks thrives on fresh ideas and novel approaches to problem solving. It requires input from the field in order to survive and achieve its purpose. Now is the right time for every Redleg to consider the future azimuth of the King of Battle. What does the Branch need that it does not have? What item of equipment does the Branch have that does not work properly or could be made to work better? These and countless other questions must be asked continuously by every soldier and civilian associated with the Field Artillery. BATTLEKING does not promise expensive advertising campaigns, posters, quotas, cash prizes, or any of that stuff — just progress, pure and simple and quick. All ideas receive equal and immediate attention; every proposal that comes in is reviewed and considered; and the submitter is recognized and advised of the status of the proposal.

BATTLEKING business is official business; so the postage is free. All that is required to become a part of the future is a little time and effort to jot down ideas. Drawings and photographs, if available, are certainly helpful. Inquiries or proposals should be addressed to President, US Army Field Artillery Board, ATTN: ATZRBDW (BATTLEKING), Fort Sill, Oklahoma, 73503. The *Journal* will continue to highlight BATTLEKING projects. Skunkworks may be an unconventional "stink tank," but it is better to be skunked in peacetime than skunked in war. ✕

MAJ Woodrow W. Harrison, FA, received his commission through the Officer Candidate School. He is also a graduate of the Aviation School and the Command and General Staff College. He was an attack helicopter platoon commander in the 2-20th FA in Vietnam. He has served two tours in Korea — one as executive officer of the 128th Aviation Company (Assault Helicopter) and the other as the C3 plans officer of the Combined Field Army. He was a battery commander for the 1-6th FA and also a battery commander, battalion S3, and battalion executive officer with the 2-1st FA. Currently, he is the deputy chief of the Tactical Data Systems Test Division of the US Army Field Artillery Board, Fort Sill, Oklahoma.



DEAL YOURSELF IN ON THE JULY-AUGUST ISSUE
Add an ace to a King, and you've got Black Jack (Pershing, that is).