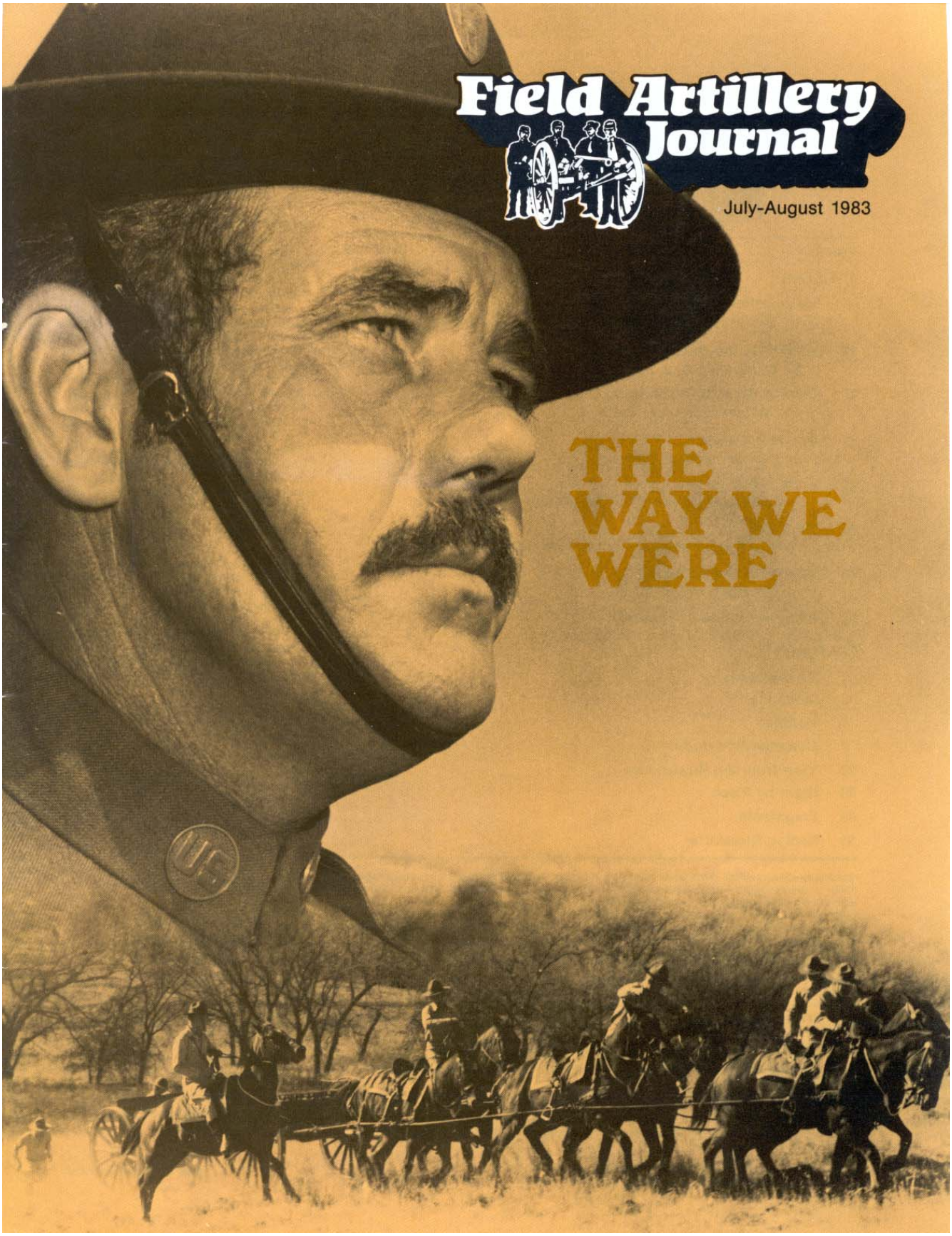
Field Artillery Journal
July-August 1983
THE WAY WE WERE

Field Artillery Journal

THE JOURNAL OF FIRE SUPPORT

Volume 51 **July-August 1983** **Number 4**

ARTICLES

FEATURES

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

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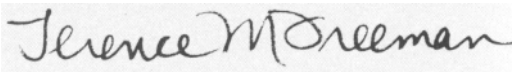
It is more than nice to remember — it is useful. In "Recollections" there are memories of a not-so-distant past which betray the illusion that a Redleg's life has changed in these years of modernization. The responsibilities, the routines, and the daily regimen of the horse soldiers will be all too familiar to the motorized gunners of today. The field artilleryman of 1983, trained to speak of memory in terms of his new computer's bytes, bits, and characters, can profit from a human memory which gives both a transient and timeless quality to the facts it recalls.

While remembering the way we were, we can also find other food for thought in this issue. There are tactical considerations aplenty in the experiences of an M198 battalion operations section performing during Team Spirit '82 and a service battery commander keeping the firing batteries moving and shooting in the European environment. There is news of a new aid to interoperability and a new device for training FISTs. Quick fire planning receives some long overdue exposure, and there is a plea for upgrading the nuclear qualification system which is so much a part of our training lives. Finally, during an exclusive *Journal* interview, the Bundeswehr's Mr. Field Artillery draws upon 40 years of field artillery experience as he answers topical questions of interest to the entire Redleg Community.

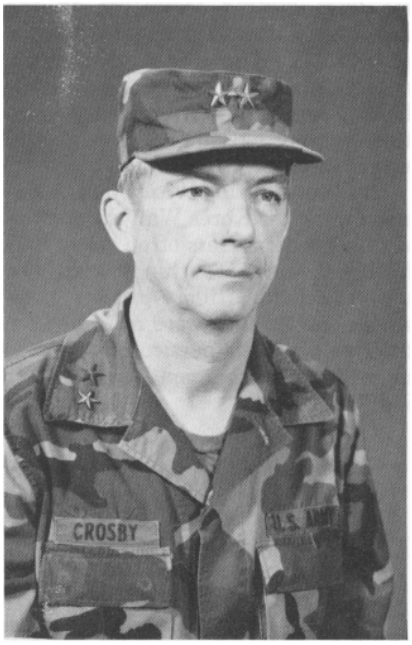
Enjoy this issue of the *Journal* and use it to share in the Field Artillery experience. There is a page in a future *Journal* with your name on it, and I will hold it for you. Catch the spirit!



EDITOR

On the Move

MG JOHN S. CROSBY



Some things do not change. What leaders do at the battery level is no different today from what it was 5, 10, or 20 years ago. They issue the orders which make things happen, they build the battery by and through an effective chain of command, and they guarantee that the force is ready to fight when it is needed. I want to talk about each of these responsibilities of leadership in turn.

Orders

Commissioned and noncommissioned leaders in the battery have two major obligations when they issue their orders. In the first place, their orders must be clear. Lack of clarity inevitably produces wasted time and energy, and it could result in failure to accomplish the mission. Secondly, once a leader issues orders, he or she must not fail to enforce them. There is room for deliberation before an order is issued, but enforcement is the rule thereafter.

Chain of command

The battery-level chain of command is the most important thing in the Army. It is still the place where leadership really counts. Our field artillery modernization is geared toward producing an autonomous gun section, and a healthy chain of command will produce the confidence and trust necessary to make that gun section successful.

When the leaders within a battery have not generated that confidence and trust, they have no one to blame but themselves. The chain of command is their responsibility alone, and they must insure that they keep it healthy in these ways:

- Define the standards of behavior.
- Establish discipline.
- Give orders in their own names.
- Inspect every day.
- Respect new sergeants and coach them.
- Conduct officer and NCO professional development programs.
- Organize activities by sections and by batteries.
- Maintain technical competency.
- Measure the health of the chain daily.

I want to single out three of these chain of command requirements for special comments. First, the experienced noncommissioned leaders in a battery must teach the junior noncommissioned leaders the basics of leadership. These new leaders will learn very quickly that they share the responsibility for what goes right or wrong in the battery. They must be coached on how to turn their knowledge into action. Next, technical competency means knowing how to get things done in every aspect of battery operations. Battery leaders must know administration, maintenance, and supply as well as they know gunnery procedures and the cannoneer's hop. I expect them to study well in their basic and advanced formal schooling and master the subject matter completely. Finally, leaders must constantly monitor the health of their chain of command. Listen to the hum of soldiers talking; hear their camaraderie. A professional leader will be tuned to their welfare and their frustrations and will know when to take actions to resolve any problems.

Readiness

The key to producing a unit that is fit to fight is a leader who has the right priorities and high standards. Battery leaders must always have the goal of readiness in their minds as they formulate their orders and exercise their chain of command. Their training programs must build for the long haul by doing first things first — do not try to do it all at once, and do not take shortcuts through the basics. A strong foundation in the basics translates directly into unit readiness and helps foster each soldier's confidence in himself and his unit.

Our soldiers will still be the primary factor in deciding the outcome of future battles. The MLRS, the RPV, the PII, the 3×8 organization, and the AirLand Battle tactics will merely be the new tools of their trade. Our battery-level leaders, by fulfilling their obligations in the area of orders, chain of command, and readiness, are guaranteeing that the victories will be ours.

Incoming

LETTERS TO THE EDITOR

Speak Out

The *Journal* welcomes and encourages letters from our readers. Of particular interest are opinions, ideas, and innovations pertinent to the betterment of the Field Artillery and the total force. Also welcomed are thoughts on how to improve the magazine.—*Ed*.

Eight-ball Cannoneers

Your recent article on the World War II Cannon Company, 16th Infantry ("Eight-ball Cannoneers," January-February 1983 *Field Artillery Journal)* was outstanding — with lessons aplenty. I sent my copy on to Major General (Ret) Al Smith, since he was a pioneer of the old 16th Infantry and a great supporter of self-propelled artillery. You have a splendid professional journal.

James H. Leach
COL (Ret), USA
Arlington, VA

More on FIST

"FISTs of Fury" (January-February 1983, *Field Artillery Journal)* left me with the feeling that there is still too much uncertainty in the concept of FIST. You are on the right track, but hauling the wrong freight — on a solid roadbed, but on poorly laid rails.

From my perspective as one who has performed system engineering of training courses, I notice a lack of real solid feedback from persons who have performed the duties of forward observer (FO), except possibly a little from Vietnam. Korea, where the forward observer system probably performed at its best up to now, has been completely forgotten — as all aspects of that war usually are.

In World War II, the only FOs authorized by table of organization and equipment (TOE) were in the armored field artillery. Now, the proposal is to have no FOs with armor units. *I wonder why?*

The three TOE FOs were in headquarters battery under the S2 — a natural assignment since FOs, by the nature of their job, are intelligence gatherers. All other FOs were firing battery officers (motor officers or reconnaissance officers) with a makeshift crew. This use of firing battery officers added three more FOs to an armored artillery battalion. *I believe that FISTs should logically be a platoon in headquarters battery under the S2*. They should *not,* as has been suggested by some contributors to the *Journal,* be under the battalion motor officer — particularly in tracked vehicle organizations. In sustained operations, the battalion motor officer will not always be able to move when the battalion does.

The Korean War-era had three FOs per firing battery (one for each rifle company supported) and a liaison officer with the infantry battalion headquarters. Unfortunately, the liaison officer was often not a shooter and therefore not adept at coordinating fires. Korea was not exactly armor country, and so what tanks there were had to depend on the FOs with the infantry.

I served in Europe as an armored field artillery FO, from Normandy until a couple of days before the "Bulge," with only a very few days rest. I fought in every conceivable battlefield situation — some of which approximate the current battlefield scenario — with tanks, reconnaissance troops, armored infantry, leg infantry, platoons, companies, battle groups, battalions, task force maneuver units, and even combat engineers, in spearheading or wide open tank fighting. I fought in hedgerows, hill country, open flat country, and streets (do not let the people at Fort Knox tell you that an FO cannot observe in cities — I can convince you otherwise).

In Korea I arrived in time to shake hands with the Chinese and greeted them by sending a brigade back toward China with 105s on their tails. Unfortunately, there were too many brigades! I worked only with leg infantry from November 1950 to May 1951 and always on terrain where no vehicle could possibly go. I became an instant expert on defensive fires; and, on occasion, the infantry unit I was assigned to did not have to fire a shot to hold its position. In both wars I occasionally had additional duties as an infantry platoon leader or, more often, temporary company commander (I would like to see the Field Artillery recognize its FOs as the Infantry does with the Combat Infantry Badge).

Why don't the system engineering people for FIST contact people like me? I'm sure there are some around. Lack of specific knowledge on current FIST tactics and procedures prevents me from writing comments on the direction it is taking. But I would be glad to talk or write to anyone knowledgeable in the FIST concept who is looking for comments or ideas. (I know that I do not like the FIST vehicle — vehemently!)

In Europe during World War II and also during the Korea War, the maneuver unit commanders often asked FOs for ideas on more things than fire support. Field artillery officers, even second lieutenants, were respected for their ability then, particularly by new maneuver unit commanders. I hope it is still the same.

Ralph R. Balestrieri
1LT (Ret), FA
Eatontown, NJ

MLRS personnel shortage

In the March-April 1983 *FA Journal,* Major General Crosby addressed the NCO shortage at the trainer/supervisor level in Multiple Launch Rocket System (MLRS) units.

I was wondering how one might volunteer to help ease this shortage? Are 13Bs being accepted or allowed to enter this field? The challenge of this new weapon system — probably the most potent and exciting weapon introduced in years — is very appealing. I am a 13B sergeant first class; and, if there is a chance for lateral transfer, I would like to give it a shot.

Stanley Freeman
SFC, FA
University of Virginia
Charlottesville, VA

NCO shortages for MLRS rest at the sergeant and staff sergeant level, but this fact does not necessarily preclude you from entering MLRS. In general, a soldier desiring reclassification to MOS 15D should apply through command channels utilizing DA Form 4187 (Personnel Action). Formal training currently offered to NCOs who have reclassified into MOS 15D is resident attendance at the Lance Officer Course, which teaches critical skill levels 1 and 2 tasks needed to support the platoon leader's role. If an NCO is identified to go to an MLRS unit after this training, he would attend the cadre training conducted for the next deploying battery. If the battery is scheduled to go overseas, he would further attend collective training with

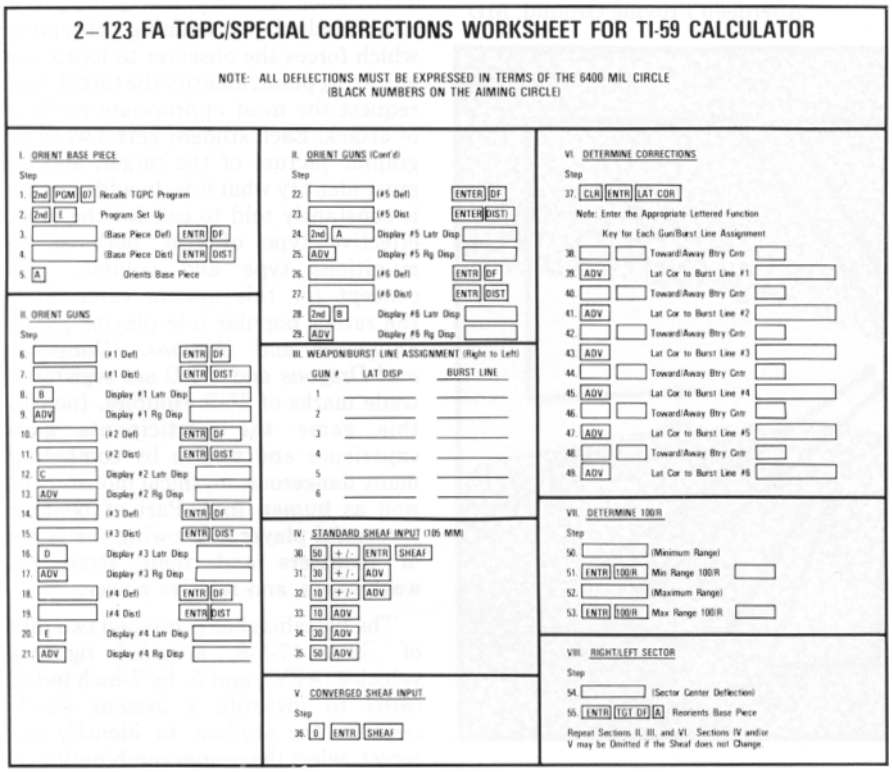
the battery. If the battery is scheduled to be deployed at a CONUS installation, new equipment training team training would be available at the gaining installation.

In your particular situation, you should submit a DA Form 4187. Since you are in an ROTC assignment, you may be stabilized; if so, you would need to request a release from your stabilized assignment with concurrences from your complete chain of command. The next MLRS battery that would be available for assignment would be battery #7, scheduled for training in the first quarter of calendar year 1984. Training and deployment with this battery would require that you attend the Lance Officer Course which begins in November 1983 and ends in December 1983. In the personnel world, this is a short fuze. The next battery would be battery #8, which is scheduled for training in the second quarter of 1984 — Ed.

Calculating TGPCs with the TI-59

The 2d Battalion, 123d Field Artillery, has found this worksheet useful in calculating terrain gun position corrections (TGPC) and special corrections with the TI-59 hand-held calculator.

David T. Zabecki
CPT, FA (ARNG)
HHB, 2d BN, 123d FA
Rock Island, IL



2–123 FA TGPC/SPECIAL CORRECTIONS WORKSHEET FOR TI-59 CALCULATOR

NOTE: ALL DEFLECTIONS MUST BE EXPRESSED IN TERMS OF THE 6400 MIL CIRCLE (BLACK NUMBERS ON THE AIMING CIRCLE)

I. ORIENT BASE PIECE

Step
1. 2nd PGM 07 Recalls TGPC Program
2. 2nd E Program Set Up
3. (Base Piece Def) ENTR DF
4. (Base Piece Dist) ENTR DIST
5. A Orients Base Piece

II. ORIENT GUNS

Step
6. (#1 Def) ENTR DF
7. (#1 Dist) ENTR DIST
8. B Display #1 Latr Disp
9. ADV Display #1 Rg Disp
10. (#2 Def) ENTR DF
11. (#2 Dist) ENTR DIST
12. C Display #2 Latr Disp
13. ADV Display #2 Rg Disp
14. (#3 Def) ENTR DF
15. (#3 Dist) ENTR DIST
16. D Display #3 Latr Disp
17. ADV Display #3 Rg Disp
18. (#4 Def) ENTR DF
19. (#4 Dist) ENTR DIST
20. E Display #4 Latr Disp
21. ADV Display #4 Rg Disp

II. ORIENT GUNS (Cont'd)

Step
22. (#5 Def) ENTER DF
23. (#5 Dist) ENTER DIST
24. 2nd A Display #5 Latr Disp
25. ADV Display #5 Rg Disp
26. (#6 Def) ENTR DF
27. (#6 Dist) ENTR DIST
28. 2nd B Display #6 Latr Disp
29. ADV Display #6 Rg Disp

III. WEAPON/BURST LINE ASSIGNMENT (Right to Left)

GUN #	LAT DISP	BURST LINE
1		
2		
3		
4		
5		
6		

IV. STANDARD SHEAF INPUT (105 MM)

30. 50 +/- ENTR SHEAF
31. 30 +/- ADV
32. 10 +/- ADV
33. 10 ADV
34. 30 ADV
35. 50 ADV

V. CONVERGED SHEAF INPUT

Step
36. 0 ENTR SHEAF

VI. DETERMINE CORRECTIONS

Step
37. CLR ENTR LAT COR
Note: Enter the Appropriate Lettered Function Key for Each Gun/Burst Line Assignment
38. Toward/Away Btry Cntr
39. ADV Lat Cor to Burst Line #1
40. Toward/Away Btry Cntr
41. ADV Lat Cor to Burst Line #2
42. Toward/Away Btry Cntr
43. ADV Lat Cor to Burst Line #3
44. Toward/Away Btry Cntr
45. ADV Lat Cor to Burst Line #4
46. Toward/Away Btry Cntr
47. ADV Lat Cor to Burst Line #5
48. Toward/Away Btry Cntr
49. ADV Lat Cor to Burst Line #6

VII. DETERMINE 100/R

Step
50. (Minimum Range)
51. ENTR 100/R Min Range 100/R
52. (Maximum Range)
53. ENTR 100/R Max Range 100/R

VIII. RIGHT/LEFT SECTOR

Step
54. (Sector Center Deflection)
55. ENTR TGT DF A Reorients Base Piece

Repeat Sections II, III, and VI. Sections IV and/or V may be Omitted if the Sheaf does not Change.

Thank God for the US Navy

On the morning of 6 June 1944, General Omar Bradley waited uneasily aboard the command ship. His V Corps was attempting the historic amphibious assault across Omaha Beach; the first message to advise General Bradley of the situation ashore read, "Thank God for the US Navy." This message reflected the great appreciation for the preceding naval gunfire (NGF) support which helped make the D-Day invasion successful.

The naval gunfire which supported the allied invasion at Normandy and other amphibious assaults in World War II was tremendous. As time passed, however, most of the big fire support ships with such voluminous firepower were decommissioned and were not replaced by modern ships. Research and development staffs were putting emphasis on antiair and antisubmarine warfare.

So what is the main point of this discussion? The point to be made is that since our fleets no longer have the large number of battleships and heavy cruisers they once had, we no longer give NGF support the serious consideration it warrants. It is seldom considered the major supporting arm that it really is. Evidence of this is indicated by the fact that at a recent supporting arms conference held at Fort Sill, naval gunfire representatives were not invited. We often call artillery the "King of the Battlefield," and it is true that massed artillery can turn the tide of the battle; but, during an amphibious assault, those howitzers are useless until we get them ashore.

We also depend heavily on air support during an amphibious assault. Due to the enemy's heavy antiair capability, we will be hard pressed to use our air assets without NGF providing suppression of enemy air defense (SEAD) fires. These SEAD fires allow our fixed-wing aircraft to get in close enough to destroy enemy targets. Naval gunfire will also be used in close coordination with the vertical assault by providing well-protected helicopter approach lanes to get our troops ashore.

Could the US Navy provide fire support for a forced landing onto a hostile beach if it were required to do so tomorrow? For those who say "definitely not," consider this. Current naval gunfire support ships have one, two, or three 5-inch 54 guns. These 5-inch guns shoot a 75-pound standard projectile over 20,000 meters. The average rate of fire for a gun mount is about 20 rounds per minute. Ships carry from 500 to 600 rounds per gun. Newer ships have, and many older ships are being refitted with, the Mark 86 fire control system. This system not only increases accuracy and reduces response time, but it also gives a two-gun ship the capability of engaging two separate targets simultaneously. Also, the Navy currently has over 80 ships in the Atlantic Fleets that are gunfire support capable. And just as a Marine must maintain his rifle qualification, so must a ship maintain her NGF proficiency.

In addition, there are some developments being implemented that promise to enhance our NGF support capability tremendously. For example, a battleship has 9 tubes, 16 inches in caliber, which fire a 2,300-pound projectile over 22 miles. Within the next few months the new high fragmentation projectile will be available which will provide increased lethality over standard projectiles and do so at increased ranges. A new illumination round has been developed that has greater illumination for a longer period of hang time and is less vulnerable to ripped chutes.

We have come to realize the necessity of fighting as a combined arms team using fire support coordination; therefore, it is imperative that we make use of the added fire support capability that naval gunfire provides us. Contrary to what some may think, the amphibious assault is as real as war itself; and we had better be prepared for both!

Brad Gates
CPT, USMC
Fort Sill, OK

Recon Smart

I write this letter as an extension to the ideas presented by Lieutenant Colonel Churchill's "Recon Smart" article in the January-February 1983 *FA Journal*.

For defense along the route of march and during the establishment of the new position, a battery commander should consider including an M548 with the reconnaissance, selection, and occupation of position (RSOP) vehicles. Its .50-caliber machinegun provides for additional firepower (I realize that "Recon Smart" was written primarily with towed artillery in mind). If the situation permits and/or an offset registration is required, a battery commander should bring the howitzer with the RSOP party.

Upon occupation of the new position, one could also consider the "box technique" of sweeping the area. Two-man teams use the buddy system and follow the pattern shown in figure 1. A minimum number of personnel are exposed to open areas, and team members maintain eye contact at all times in case one member makes contact with an enemy force.

Each howitzer crew member on the RSOP team has a 2-meter bar as part of his RSOP equipment. Two camouflage poles, with tape on either end to mark the 2-meter limits, are assembled at the new position. After the initial deflection is announced to the gun guide, the distance to the aiming circle is determined using the stadia method. The 2-meter bar is disassembled and stored in the gun guide's equipment bag. (An alternate method is to use the M16 rifle as reported in the January-February 1982 *FA Journal*, pages 21 and 22.) The fire direction center (FDC) representative assists the first sergeant/chief of firing battery at the aiming circle. He can operate the telephone and record the initial data. Additionally, equipped with a TI-59, the FDC member can have terrain gun position corrections established prior to the main body's arrival by using the initial deflection and distance measured under the stadia method.

A final technique that was employed and is offered as an addition to "Recon Smart" is the setup of the aiming circle. Lieutenant Colonel Churchill alluded to positioning the aiming circle so as to provide the capability of properly camouflaging the instrument. Rather than fully extending the tripod legs, the aiming circle can be set up with a low profile, which not only assists the camouflage efforts, but also gives the instrument operator protection by not "standing in the open."

These ideas are not intended to override those presented by Lieutenant Colonel Churchill, but are offered as techniques that were practiced with success in an M109A2 battery in Germany.

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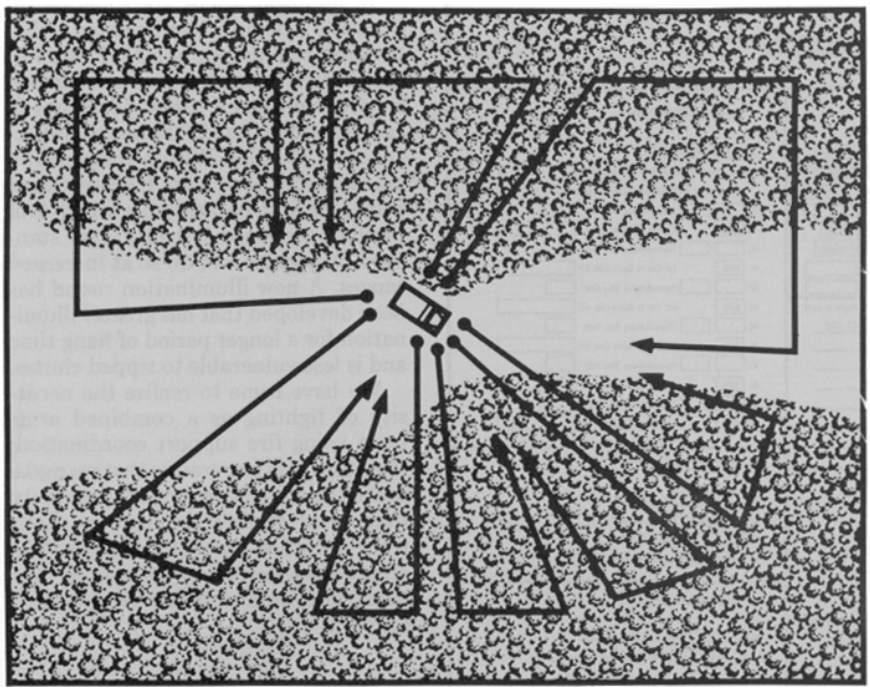


Figure 1. Box sweep.

Target training cards for observed fire

As a second lieutenant attending the Field Artillery Officer Basic Course (FAOBC) learning observed fire, I watched another FAOBC student firing at some piece of rusty junk on the south slope of Signal Mountain. The wreck had been identified as a "sampan unloading weapon" or something like that. I suggested, in my ignorance, that fuze delay might be good since the concussion could rupture the hull or overturn the sampan. The gunnery instructor, fresh from Vietnam, caustically informed me that the flat hull of a sampan would not react to fuze delay in this manner.

It is unfortunate that in training our observers we tend to forget that many are as ignorant as I was about what a target really looks like or what its vulnerable parts are. Instead, we identify pieces of junk, old cars, and tanks as "troops in the open," "dismounted squad attacking," T72s and ZSU-23/4s in the tree line," and so on, assuming that the student will know what the target looks like from the designation given. Then, normally, the student calls for HE, fuze quick, and attempts to bring effective fire on the adjusting point. By stressing only target location, we have lost the valuable teaching points of target identification and most effective method of attack.

Over the past year the 1st Battalion, 111th Field Artillery, has developed a new method of training observers which forces the observer to locate his adjusting point, identify the target, and request the most appropriate method of attack. Each student gets a word or graphic picture of the target, and he must identify what it is. In addition, he is constantly told to call for the most effective type of fire, both as to munitions type and volume. The concept for this system came from the rather popular role playing game, *Dungeons and Dragons. (Dungeons and Dragons* and *D&D* are registered trade marks of TSR Hobbies, Inc.) In this game the participants gain experience and wealth by combating many dangerous, mythical monsters as well as human foes. Part of being a successful player is knowing the types of monsters and their strengths, weaknesses, and relative power.

The battalion has combined two sets of GTA 17-2-8, armored fighting vehicles (AFV), and 5- by 7-inch index cards to institute a system which requires the student to identify his target, select the proper combination of

Suppression Neutralization Destruction

Fuze ..... Time ..... Time ..... Time
Projectile..... Dual purpose ICM (DPICM) for all
Volume per . Btry 2 ..... Bn 1..... Bn 4
aiming point

Note: *One to five tanks equal one aiming point. Five or more tanks equals two or more aiming points.*

Smoke is effective if one is about to engage friendly armor. Use immediate smoke, followed by DPICM. If Copperhead is available, use Copperhead for one or two tanks; for five or more, consider request for attack helicopters or TACAIR.

For one vehicle, point out to infantry for attack with LAW, TOW, or Dragon if within range. *For three to five vehicles,* attack and either suppress or neutralize. *For seven or more vehicles,* attack and either neutralize or destroy (vehicle is extremely dangerous and probably in a first line elite unit; therefore, get all available assets, especially air in large numbers).

Figure 1-1.

shell/fuze/method/volume of fire, and call in his mission. For an armored vehicle target, the student is shown a 5-by 7-inch index card to which is attached one GTA 17-2-8 card showing the front and profile of an AFV (figure 1-1). The instructor has the same card from the second deck; but his card shows the profile, nomenclature, and recognition features. In addition, the instructor's index card has typed on it "correct" combinations for method of attack for suppression, neutralization, and destruction, as well as actions to be taken based on the approximate number of vehicles seen (figure 1-2). Method of attack is taken from unclassified effects tables, tempered with personal experience.

Figure 1-2.

Targets without AFVs are harder to portray, but are basically a word description, telling what the individual would quite likely see (or hear during night missions without illumination support). Weapons are described in general detail, but with enough characteristics so that a student with an adequate knowledge of weapons and equipment could tell what they were and what they were doing (figure 2-1).

Individuals:
To your front you see a group of 8 to 10 men. Most of them appear to be digging shallow holes and placing small cans into them. They seem to be taking great care. Some of the cans are about the size of a tin can; others look like a cake pan of some sort. The men are filling in the holes as they go. One seems to be sketching or writing on paper; he seems to be noting where the cans are being buried. The men are wearing what seems to be the old campaign or Smokey Bear hat and light green and tan camouflaged uniforms. Their weapon is short, with a wooden stock and a long, forward curving magazine. Their belts, straps, and most of the gear are made of leather.

Figure 2-1.

Any relatively small, common battlefield target could be described. Again there is a second card for the instructor (figure 2-2) with the target identified and "the school solution."

Individuals: Soviet sappers laying a minefield.

Suppression Neutralization Destruction

Fuze ..... VT ..... VT..... Ti
Projectile ..... HE ..... HE ..... ICM AP
Volume..... Plt 1..... Btry 1..... Btry 1

Figure 2-2.

Obviously a unit with access to opposing forces (OPFOR) uniforms and individual equipment could do even better with a series of photographs of small unit activities in a natural setting. Through a proper use of distance and camera lens, the target could be photographed such that it would appear to be any distance from danger close to five kilometers or more. The pictures could then be mounted on a card for future use.

In addition to a basic set of cards containing information on OPFOR personnel and equipment, one may add friendly elements (lost FO parties, stalled allied vehicles, downed fliers trying to cross to friendly lines, etc.). These additions would help stress positive recognition. Finally, vehicle and personnel cards can be combined for dismounted personnel operating with vehicles.

The method of employment is to assign the observer an adjusting point, give him a card, and request his call for fire. He can then be evaluated on target location, identification, and engagement. The first time the observer knocks out a Scorpion or Leopard, the need for positive identification sinks in. The fire direction officer also receives valuable training since the request is frequently for projectiles he does not have or volumes he cannot deliver and so he must pay closer attention to his fire order. The message to observer also becomes very important in the training.

Even though the 1-111th FA is a general support unit in which observer training has a low priority, this system was well received. Observers felt it gave them useful training and an incentive to know what typical battlefield targets might actually look like — not what they might imagine them to be. In addition, it gave added reason to call for more effective fuze/projectile combinations.

Eugene P. Moser, Jr.
MAJ, FA (USAR)
Hampton, VA

TI-59 gunnery worksheets

When I was the fire direction officer for Battery A, 1st Battalion, 37th Field Artillery, I loved using the TI-59 calculator. It worked great for two-gun raids, hipshoots, simultaneous missions, and sustained fire direction center (FDC) operations. However, my feelings were not shared by the FDC NCOs; they felt that it was too hard to learn to use the calculator and complained that the Field Artillery School Gunnery Department's Reference Note (GDO5HC, RN, Sep 81) was too hard to understand and too time consuming if one needed the answer to a question during an actual mission.

I contacted a Gunnery Department instructor for assistance and found that the School did not have what I felt was necessary. As a result I designed a set of TI-59 gunnery worksheets that are 105-mm howitzer peculiar. With minor modifications for a different weapon system, it is possible to devise worksheets different from my basic ones. If any field artilleryman would like a copy of my worksheets, drop a line to: Commander, ATTN: S2, 1st Bn, 37th FA, Fort Richardson, Alaska 99505 (telephone 317-862-2184).

Charles E. Roller
1LT, FA
S2, 1-37th FA
Fort Richardson, AK

Move fast and deep

With reference to Major Randy Wilkes' article entitled "Move Fast and Deep" *(FA Journal*, March-April 1983), I applaud the way in which the commander of the 3d Battalion, 19th Field Artillery, used the flexibility given to him by a non-rigid system of doctrine to supply the required field artillery support.

In certain small areas I believe the author presents a rather slanted view and displays a less than perfect knowledge of current US field artillery doctrine, but the article has real educational value because the 3-19th FA used "movement by battery" as outlined in FM 6-20 and formulated a battalion SOP to suit the National Training Center scenario.

I hope it is not the author's intent to deny other commanders the flexibility given to this unit. I think that all lessons learned at the NTC should be voiced. If a rigid employment technique as outlined were to become doctrine, the loss in flexibility would quite clearly be to the detriment of the field artillery in general. The lack of operational experience of commanders requires articles of this nature to be published; and these articles should be read, analyzed, and used by all field artillerymen.

The present and future FA commanders should have the attitude, "Tell me what you did. Do not tell me how I will do it." This attitude will enable field artillerymen to retain present-day flexibility and at the same time educate each other by sharing experiences. Doctrine should be tight enough to point us all in the same direction, but loose enough to allow reaction to local problems.

P. I. Rose
MAJ, Royal Artillery
Fort Sill, OK

Reunions

2d Battalion, 17th Field Artillery (Vietnam 1965-66) — 6 August 1983 in Lawton, Oklahoma. Contact Avery Hall, 4220 NW Lindy Avenue, Lawton, OK 73505.

4th Field Association (Mountain Pack) — 10 September 1983 at the Bordeaux Motor Inn Convention Center in Fayetteville, North Carolina. Contact Master Sergeant (Ret) Dallas M. Kirby, 1536 Paisley Avenue, Fayetteville, NC 28304.

Hotline

QUESTIONS AND ANSWERS

Your "Redleg Hotline" is waiting around the clock to answer your questions or provide advice on problems. Call AUTOVON 639-4020 or commercial (405) 351-4020. Calls will be electronically recorded 24 hours a day and queries referred to the appropriate department for a quick response. Be sure to give name, rank, unit address, and telephone number.

Please do not use this system to order publications. Consult your FA Catalog of Instructional Material for this purpose.

Question: I have a question concerning the computation of safety for illumination rounds. Do I compute the data as if the fuze were functioning or nonfunctioning?

Answer: *Safety computations for illumination rounds are always computed for a nonfunctioning fuze, since there is no guarantee that every fuze will function as designed. Simply go to the graphical firing table for illumination and extract the elevation-to-impact corresponding to the minimum and maximum ranges. These values are the minimum and maximum quadrant elevations. For minimum time, either enter the tabular firing table at the elevation-to-impact for minimum range as derived from the graphical firing table, or use the graphical firing table for HE at the elevation-to-impact for minimum range and read the minimum time on the M564 line.*

Question: What is the line number of the pedestal mount for the Ground/Vehicular Laser Locator Designator (G/VLLD) used with the M113? My TOE shows it as M75450, but I have been told this number is not correct.

Answer: *The G/VLLD Project Manager's Office confirms that M75450 is the correct line number.*

Question: If I am firing a normal adjust fire mission without a registration, should I use drift or eliminate drift?

Answer: *The Field Artillery School teaches that drift is not included in the firing data for the initial round in a manually computed adjust fire mission. Studies indicate that the average target location error is less than 250 meters; therefore, the drift (normally 2 to 8 mils) will have no observable effect on the first round. It is important to emphasize, however, that the programs for the battery computer system, the hand-held calculator, and FADAC automatically include drift.*

Question: How do I obtain the plug from the adapter to the TI-59 and the fuze cover on the 24-volt system?

Answer: *The plug from the adapter to the TI-59 is the Adapter, Connector, which is part number 1178537 and costs $2,00. In order to get the fuze cover, one must order the Charger, Adapter, DC, NSN 1220-01-082-1622, at a cost of $13.78. Prior coordination with the US Army Armament Materiel Readiness Command (AV 793-6900/3313) will facilitate these orders.*

Question: What is the difference between the blue and the red numbers on a graphic munitions effects table (GMET)?

Answer: *The blue numbers on the GMET are the recommended solutions, while the red numbers are possible solutions for those times when ammunition or other constraints may prevent the use of the recommended solution.*

Question: The "Hotline" for the March-April 1983 *Field Artillery Journal* made reference to Change 9 to FT 155-AM-1. What is the date of that change?

Answer: *Change 9 to FT 155-AM-1 lists the fuze corrections for the M577 fuze and is dated January 1982.*

Question: Is drift included in the initial firing data of a high burst registration?

Answer: *Drift is not included in the initial firing data of a high burst registration. However, it is automatically included in the chart deflection; and so when the total deflection correction from the registration is computed, drift must be stripped out before the GFT deflection correction can be applied to a new target. For a new target, drift is computed to that target and then applied to the GFT deflection correction; and then that sum is applied to the chart deflection to get the deflection fired.*

Question: Can you tell me something about the penetrative power of dual-purpose improved conventional munitions (ICM) and RAMS scatterable tank mines against armored vehicles?

Answer: *Dual-purpose ICM is capable of penetrating 2.75 inches of homogeneous armor plate. RAMS scatterable tank mines are effective against all known threat armored vehicles.*

Question: Can the observed fire fan be used to obtain direction to a target?

Answer: *Yes, the observed fire fan can be used to assist in obtaining direction to a target; however, it will not produce a direction as accurate as other methods (i.e., compass or aiming circle). Therefore, the Field Artillery School's Gunnery Department teaches that an azimuth-measuring device be used if it is available and that the observed fire fan be used only when it is the only aid available.*

Question: When I follow the instructions (page 43B of the January 1983 reference note for the TI-59 calculator) for solving a nuclear

meteorological plus velocity error (met + VE) calculation with the TI-59, a flashing zero appears after I push the alpha control key. I do not believe this is a calculator problem since all eight of our calculators exhibited the same problem. What's going on?

Answer: *There is a possible explanation for the flashing zero. It seems to be characteristic of some TI-59 calculators that the ENTER command will not register if the operator presses down on the ENTER key too long. If the operator makes this mistake (or just forgets to press the ENTER key prior to pressing the NUC key), the result is that the calculator will not override the basic NUC function and will search for a routine in the calculator memory rather than in the chip memory. In any event, since the only function of the NUC key in the met + VE solution is to apply complementary range to the displayed corrected range, an operator could compensate for the computer malfunction or operator error by applying complementary range to the displayed corrected range when he presses the 2ND, C key.*

Question: My unit still has M424 HES projectiles with which to conduct M422A1 registrations, but we just received formal word from the Field Artillery School that we should register with conventional high-explosive round M106 and transfer the registration data to the M422A1. Will TM 9-1100-218-10/-20 be changed to reflect the new procedures?

Answer: *The -10 manual will not change until all M424 HES projectiles are expended during ARTEP training. The combat mission load transportation procedures in the -20 manual are being revised to reflect the deletion of the M424.*

Question: According to TM 38-750, muzzle velocity readings are to be entered on DA Form 2408-4 in column 10. When one measures the muzzle velocity with the M90 radar chronograph, how often is the reading entered on the 2408-4, and is it the raw reading with a powder temperature or the adjusted muzzle velocity which is entered as stated in table E of the tabular firing table?

Answer: *Each time one calibrates a powder lot with the M90 velocimeter, the updated muzzle velocity should be entered in column 10, DA Form 2408-4. The entry should be the calibrated muzzle velocity, not the raw reading from the M90 velocimeter. The muzzle velocity correction for nonstandard conditions is taken from MVCT-M90-1, which is available by writing to the Commandant, US Army Field Artillery School, ATTN: ATSF-GA, Fort Sill, OK 73503. One should not use table E of the tabular firing tables to derive the muzzle velocity correction.*

The Gunnery Department's ***Research and Analysis Division Information Note 18,*** *"Calibration and Muzzle Velocity Variation (MVV) Transfer in Charge Groups," describes calibration using the M90 velocimeter. Calibration is now a continuous process, not just an annual event. Every time a unit fires, muzzle velocity information should be updated.*

Every cannon battalion was mailed copies of Information Note 18 recently. It should be consulted for muzzle velocity management information until FM 6-40 is published in its revised format in early 1984.

Commanders Update

BG Donald E. Eckelbarger
VII Corps Artillery

BG Thomas J.P. Jones
Assistant Commandant
US Army Field Artillery School
Fort Sill, OK

COL Gary L. Brown
4th Infantry Division Artillery

*COL J.H. Binford Peay III
9th Infantry Division Artillery

*COL Raymond S. Hawthorne
24th Infantry Division Artillery

COL Fred N. Halley
82d Airborne Division Artillery

LTC Richard H. Vail
2d Battalion, 2d Field Artillery

LTC L. Kirk Lewis
3d Battalion, 9th Field Artillery

MAJ (P) James E. Shane, Jr.
1st Battalion, 10th Field Artillery

LTC Nick C. Harris
1st Battalion, 11th Field Artillery

LTC William W. Beverley, Jr.
2d Battalion, 11th Field Artillery

LTC Gary W. Nelson
1st Battalion, 13th Field Artillery

LTC Edward T. Teixeira
3d Battalion, 13th Field Artillery

LTC Jerry L. Laws
1st Battalion, 14th Field Artillery

LTC Harry F. Eng
2d Battalion, 17th Field Artillery

LTC David A. Rolston
1st Battalion, 21st Field Artillery

LTC Samuel P. Walker
2d Battalion, 27th Field Artillery

LTC Mickey S. Evans
2d Battalion, 31st Field Artillery

MAJ (P) Francis N. Ford
2d Battalion, 34th Field Artillery

LTC Robert C. Steelman, Jr.
1st Battalion, 35th Field Artillery

LTC David A. Napoliello
6th Battalion, 80th Field Artillery

LTC James B. Briggs
1st Battalion, 83d Field Artillery

LTC Thomas A. Cindric
2d Battalion, 83d Field Artillery

LTC John E. Turlington
2d Battalion, 92d Field Artillery

LTC Duane E. Williams
1st Battalion, 320th Field Artillery

LTC Lee L. Hayden
2d Battalion, 320th Field Artillery

LTC Floyd L. Trimmer
2d Battalion, 321st Field Artillery

LTC Jack G. Wolf
1st Battalion, 333d Field Artillery

LTC Larry R. Burnette
3d Cannon Training Battalion
Fort Sill, OK

LTC Vincent O. Fuentes
193d Combat Support Battalion

*In the May-June 1983 *Journal*, COL J.H. Binford Peay III was listed as commander of the 24th Infantry Division Artillery. However, COL Raymond S. Hawthorne is still the commander of the 24th Infantry Division Artillery; COL J.H. Binford Peay III is commander of the 9th Infantry Division Artillery.

RECOLLECTIONS

A FIELD ARTILLERY HORSE SOLDIER REMEMBERS

by Mr. John J. McMahon

From February until December 1941, Mr. McMahon served as an enlisted man in the 112th Field Artillery Regiment, horse-drawn, stationed in the animal area of Fort Bragg, North Carolina. These are his recollections of those bygone days. — Ed.

All horses assigned to Army units were from two remount stations in the United States: El Reno, Oklahoma, and Front Royal, Virginia. Generally, Army horses were bay, chestnut, or black. There were red roans and blue roans; but the Army did not buy white, appaloosa, or paint horses. About 95 percent of the Army horses were geldings, and the other five percent were mares. When an Army horse reached the age of 20, it was retired and put out to pasture.

The typical Army horse was at least 14 hands tall (four inches per hand); and, depending on its weight, it was either a single mount or a draft horse which was driven from a wagon. The draft horse was used to pull mountain wagons (two horses) or escort wagons (four horses). Six-horse hitches were used to pull limbers and 75-mm guns, limbers and caissons, and reel carts. The six-horse hitch consisted of a lead team (front), swing team (middle), and wheel team, with riders on the near horses — the horses on the left side (the horses on the right side were called off horses).

An Army horse was branded on the left side below its clipped mane with a two-inch number and letter. The Army horse was always shod (unless it had a foot problem) and always wore a leather halter whether it was in the corral, in the stall, or under the saddle. At night it was tied short, approximately 18 inches, with a halter shank. (The halter shank is a cotton-type rope about three-fourths of an inch in diameter and about eight feet long.) The horse stalls measured approximately four feet by ten feet. Each battery had approximately 125 horses, and each horse was assigned to a soldier. If a horse died because of neglect or carelessness, the soldier was charged $165. Horses were watered twice a day — once in the morning and again at night — and were fed one three-pound coffee can full of oats, a handful of bran, and two blocks of hay per day. They were bedded down with straw — two blocks per stall, shaken out, and spread over the stall with a pitchfork. After the horses were watered in the morning, they were turned out into the battery corral; and their stalls were cleaned. The corral was located at the end of the stables.

Each battery had two large stables which contained stalls, feed rooms, and tack rooms (all saddles, bridles, and harnesses were called tack). Below the second stable was the blacksmith shop, the saddler's room, the stable sergeant's room, and rooms for the two stable orderlies. In addition, the first sergeant assigned two men from the battery for stable police each day to clean stalls, load manure, and carry the manure to the post compost pile approximately five miles away. In addition, these men would bed down the stalls, unload hay or oats, or perform similar tasks.

Our regiment had a medical detachment with a veterinarian section. There were two officer veterinarians and approximately 10 enlisted men who gave the horses shots, wormed them, and generally looked after their health. Our regiment had a band, but it was not mounted. Our service train, later known as the service battery, was truck-drawn rather than mounted. Several years before I joined the unit, the band and service trains were mounted and used mountain wagons (small wagons with a seat for the driver) to haul supplies.

Before I joined the unit, the limbers, caissons, and 75-mm gun had wooden wheels with steel rims. While I was with the unit, the wooden wheels on the 75-mm gun were replaced with rubber tires (called pneumatic tires).

Each firing battery — A, B, and C in the 1st Battalion and D, E, and F in the 2d Battalion — had four French 75-mm guns and four caissons to carry the ammunition. One caisson and one 75-mm gun comprised a section, and each battery had four sections. Each gun and caisson was attached to a limber with a six-horse hitch consisting of lead, swing, and wheel teams. The Army tried to match each team as much as possible in size, weight, color, and pulling power. Each horse had its own personality — some worked well while others were lazy. Pulling horses were put together, and lazy horses were put together. The driver used a riding crop or whip to force the lazy horses, and he had to keep the traces tight. The draft horse riders wore long-shanked spurs, whereas the single mounted soldiers had short-shanked spurs.

Each section had 12 men; eight were mounted, and four rode the limbers. The sergeant, who was the section chief, and the gunner corporal always rode single mounts.

Headquarters battery had a reel cart which carried reels of wire and was pulled by six horses. Wire from the reel cart was laid to forward observers and to units the regiment was supporting. Each firing battery also had a reel cart; and, when the firing battery was in position, wire was laid to headquarters battery where the command post was located. The reel cart rolled the wire onto the road; and, about 300 yards to the rear, a pikeman (a mounted soldier with a long pole with a hook on the end) piked the wire to the side of the road or onto trees or bushes out of the way of traffic. If firepower was needed before the wire was laid, signalmen with flags relayed the information.

During drills, each horse always had a halter shank attached to the halter; the shank was looped over the horse's neck and then tied loosely around the neck. If the unit was to be out in the field for more than one day, a canvas nose bag with two straps was put around the horse's neck; one strap went over the horse's head

Photos by SP4 James Williams.

in back of his ears and the other around his neck. In the field, the horses were watered out of canvas troughs (similar to the present-day above-ground swimming pools) approximately 10 to 15 feet in diameter and approximately two feet high. Normally, four of these troughs were set up by our service trains in an area where they could be filled from a stream, river, or pond. Each battery watered its own horses in shifts, with each soldier leading two to four horses. Sometimes the soldiers had to walk as much as two miles to water their horses.

At night in the field, the horses were tied to a hemp rope (about 1 1/2 inches in diameter) picket line which was stretched approximately 50 feet between two heavy posts and tied approximately three feet above the ground. The horses were tied by their halter shanks on both sides of the picket line and positioned about two feet apart. At the end of the picket line was a canvas lean-to shelter where the tack and feed were stored.

When preparing to go out in the field for two or more days, each soldier took a sock-type cloth about two feet long and three inches in diameter, tied it at one end, filled it with oats, tied the other end, and then tied it in the middle. The soldier rolled this package in his raincoat, strapped it to the pommel of his saddle, and thus had a two-day ration of oats for his horse. The Army raincoat issued at that time was slit up the back, almost to the waist, so that it covered the back of the saddle and the soldier's legs, protecting him and the saddle from the weather. His blanket was rolled up in a shelter half, along with his tent poles, pegs, rope, and dark blue fatigue uniform. The saddle bags, which were looped over the saddle, carried the mess kit, shaving gear, "smokes," underwear, curry comb, and brush. The bed roll was placed over the saddle bags and strapped to the cantle of the saddle.

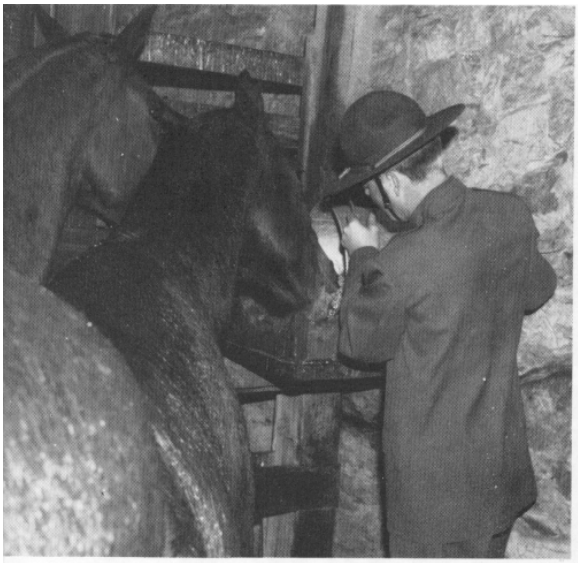
When we saddled the horse, we folded the Army blanket so that the "US" showed on the right corner of the horse's left side. Incidentally, we soldiers used the saddle blanket at night for warmth, since we each had only one blanket in our bed rolls. The saddle, fully loaded, weighed about 50 to 60 pounds. In addition to this equipment, the single mount carried a halter, halter shank, feed bag, and bridle. The draft horses were harnessed and had the same equipment on the saddle.

The dress for the soldier was khaki in summer and woolen, olive drab in winter, both with campaign hat. The cord on the campaign hat indicated the soldier's branch of service. Red was for artillery, blue for infantry, yellow for cavalry, and maroon and white for the veterinarians and medics. Officers wore black and gold braided cord on their campaign hats. During simulated combat conditions, we were outfitted with the steel helmet (World War I vintage), a gun belt with .45-caliber automatic gun, extra clips, first aid pouch, and canteen. In the fall or spring, we wore a field jacket; and, in winter, we wore an overcoat. The overcoat was split up the back like the raincoat described earlier. The pants (called breeches) worn by horse soldiers fitted tightly from the knee down. Enlisted men wore laced

boots with hooks from the instep up until late in 1941 when we were issued a new type of boot which laced to the instep and had a leather flap with three buckles on the side. Officers had pull-on boots, which usually laced to the instep.

When the horses were all saddled, they were led to the gun park where the draft horses were hitched to the limbers. When this action was completed, the captain mounted his horse and issued the command "Stand to horse." Each man went to the left front of his horse, held his horse's halter under the chin with his right hand, and stood at attention. The next command was "Prepare to mount," at which time we took the reins in the left hand, placed the left hand on the pommel of the saddle, put the left foot in the stirrup, put the right hand on the cantle, and held this position until the command "Mount" was given. We then threw our right foot over the saddle, put the right foot in the stirrup, and sat at attention until the command "Forward, column of twos, ho!" was given. While this command was being given, the captain would raise his hand, palm facing the direction of travel, and lower it at the command "Ho!" When the captain wished the column to stop, he raised his hand. When he wished the column to trot, he raised his arm with clenched fist and pumped three times; if we were trotting when he gave this same signal, it meant we were to canter. If the captain wished the column to turn right or left, he raised his arm and then lowered it in the direction desired. While leading his battery, each captain was flanked, slightly to the rear, by his guidon bearer and bugler. When the column came to a crossroad, the guidon bearer would stop at the intersection until the next battery guidon bearer replaced him. He then loped up to his position beside the captain.

When we first mounted our horses to leave the regimental area, we walked our horses for about 15 minutes. The captain would then halt the battery and



have the men dismount and tighten cinches because some horses "blew up" with air while they were being saddled, which would loosen the saddle when they exhaled. We also checked to insure that the saddle blanket was properly under the saddle so that the saddle would not rub sores on the horse's back. A saddle sore was an inexcusable happening, and the responsible soldier was grounded until the sore healed. Rest assured that this soldier would be on kitchen police, stable police, and latrine orderly duty during that time.

While the first 15 minutes of a ride was always at a walk to make certain the horse warmed up slowly and had not inhaled air, the last 15 minutes was also at a walk to allow the horse to cool down before being unsaddled. If it was a hot day and we dismounted at the stable area, the stable sergeant checked the horse to determine whether it was warm or hot by putting the palm of his hand between the front legs of the horse; if, the horse was hot, he was led by the halter shank at a slow walk until he cooled down. The soldier would then unsaddle his horse, rub him down, brush and curry him, clean his hooves, water him, and turn him into the corral where he normally rolled in the sand. The soldier then took his tack to the tack room and cleaned the saddle with saddle soap.

The enlisted man's saddle was a McClellan saddle, while the officer's saddle was an English style with short stirrups, called flat tack. The Army style of riding was to sit forward in the seat as opposed to the western style where the rider sits back in the saddle. The knee grip and the reins were held taut between the rider's hands and the bit. In the trot, the soldier posted the saddle (moved up and down with the motion of the horse). When being taught to ride, the soldier was put on a horse without the saddle until he learned the knee grip.

Mounted guards were assigned areas (called posts) to ride around the regimental area 24 hours a day. Regimental guard duty personnel were changed daily at 1600 hours; while on guard duty, they were "on" two hours and "off" four hours. They slept and stayed in the guard barracks.

Each battery was allowed one goat for a battery mascot. Goats were permitted because they had a calming effect on the horses. Our goat was all black, and we called him John Henry Ledbetter the Third. The regimental goat was a big goat with huge horns and was called Reggie.

I remember the date of 1 December 1941 with sadness, because on that day the Department of the Army ordered our unit to become motorized. We lost our horses, buglers, boots, breeches, campaign hats, and goats. It was truly the end of an era, and I recollect those bygone days with a good deal of fondness.

At the age of 17, Mr. John J. McMahon enlisted in the 112th Field Artillery Horse-Drawn Regiment, a part of the New Jersey National Guard. This regiment was federalized on 27 January 1941 and assigned to Fort Bragg, North Carolina. After War was declared, the unit lost the horses and became motorized artillery and later armored artillery and was redesignated 696th Armored Field Artillery. During World War II, Mr. McMahon served in Europe as a bow gunner in a forward observer's tank. After receiving five battle stars and an honorable discharge in 1945, he became a police officer in Trenton, New Jersey, where he spent 17 years, receiving five commendations. He organized and became the first commander of the 112th Field Artillery Association in 1965. Mr. McMahon, a recipient of the Honorable Order of St. Barbara, is now residing in retirement in McLoud, Oklahoma.


FRC
14
CAUTION

Qualifying the Qualification

by Major Michael J. Speltz

In these more enlightened days of Nuclear Weapons Technical Inspections (NWTI) — an Army Training and Evaluation Program (ARTEP) plus a Technical Validation Inspection (TVI) — there really is no need for the problems created by chapter 8 ("Evaluation and Qualification Requirements") of Army Regulation 50-5, *Nuclear Surety*. The Army needs to take a new approach to the nuclear qualification system — one which is more supportive of the Army's system of training, personnel, and mission accomplishment than is the existing system.

According to AR 50-5, nuclear qualification is "a determination by a MACOM [major command] commander that a nuclear-capable unit is capable of performing its nuclear mission and has been authorized to do so." From this definition one can surmise that the three elements of nuclear qualification are:

- The involvement of a Department of the Army major command.
- A positive evaluation that a specific unit performs to standards.
- A focus on the nuclear tasks contained in a unit's mission.

In other words, in the spirit of the Army's current training jargon, nuclear qualification represents a unit's ability to perform nuclear tasks to standards. This definition sounds reasonable enough, but there is a disparity in the way it is currently being applied.

Involvement of a major command

The use of a TVI in conjunction with an ARTEP demonstrates the Army's willingness to entrust its division artillery and field artillery brigade commanders with a part of the nuclear qualification system. Under the TVI/ARTEP concept, the MACOM commander is to use a subordinate unit's ARTEP as evidence of its ability to "successfully complete all nuclear tasks," but that is easier said than done (AR 50-5, paragraph 8-48 (2)). There are two critical problems of interpretation here, for ARTEPs look at things differently than the Nuclear Surety Inspections (NSIs) and TVIs prescribed by AR 50-5.

First of all, one must decide how to interpret a "successful" completion of a task. AR 50-5 defines "successfully" as "measured against ARTEP tasks, conditions, and standards" — it requires, in other words, that one evaluate conditions as well as tasks. AR 50-5 supports a "standardized evaluation and qualification system" and then gives as one of its objectives the need to "determine the capability of a unit to accomplish its assigned mission in a safe and secure environment." The emphasis here seems to be more on the safe and secure environment (the conditions) than it is on the accomplishment of the assigned mission. Yet it is clear from language in the ARTEP itself that in an ARTEP one can adjust standards to conditions — one man's success in blinding snow could be another man's failure in balmy weather. ARTEP 6-365 is quite clear:

> "The ARTEP is not a test . . . Belief that it is like these [previous Army] tests has caused the ARTEP to be used as a pass/fail exercise rather than for its intended diagnostic purpose. The ARTEP . . . contains no mathematical solutions to establish overall unit readiness."

Notably absent from the most recent edition of ARTEP 6-365 is the statement from an earlier edition that "The report will include ratings for each task/mission . . . ." The ARTEP is simply not designed to answer the question of successful completion with a yes or no, though chapter 8 of AR 50-5 says it does; rather, it answers the question with an explanation of "here is what happened."

Secondly, one must interpret the precise nuclear tasks required by the evaluation for nuclear qualification. An ARTEP/TVI contains far more nuclear tasks than an NSI. Tasks such as fire direction and survey are certainly critical to the accomplishment of the nuclear mission of a howitzer battalion; and yet, while they are evaluated during an ARTEP, they are not part of an NSI. There is far too little coherence between the two systems.

A positive evaluation

The second element of nuclear qualification — a positive evaluation that a unit performs to standards — also has problems which stem from differences between AR 50-5 and the ARTEP/TVI. Though the ARTEP should not be used as a pass/fail exercise, the AR 50-5 meaning of "deficiency, failing" is all too clear.

Photos by Sam Orr.

And if these two words left any doubt in one's mind, the appending of "reinspection required" makes it absolutely certain that AR 50-5 treats nuclear qualification as a zero-defects proposition. A lieutenant colonel who has experienced the evaluations has put it this way: "The one unforgiveable sin of a commander of a nuclear-capable unit is to bust an inspection so bad he requires a reinspection."

Some argue that the NWTI moves away from the zero-defects proposition because many deficiencies are not considered failing and because there is no overall rating. They cite the many constructive comments from NWTI inspectors which do not appear in the final report; and they argue that the spirit of the NWTI reflects the ARTEP emphasis on a helpful inspection team which does not divorce training from an inspection.

Unfortunately, no matter how much of this support is provided and no matter how much training is accomplished ("deficiency failing, correction verified"), the *possibility* for failure always exists; and this possibility creates the all too familiar dilemma: though the soldiers need to succeed and to be able to learn from their mistakes, the commander must insure the safety, security, and reliability of his nuclear weapons.

The same lieutenant colonel commander who recognized the "one unforgiveable sin" felt obliged to give the following guidance to his subordinate commanders the very first time he met with them: "Soldiers are in the Army to succeed, not to fail." He was demonstrating his conviction that his soldiers shared his desire to accomplish the mission and that the soldiers would in fact get the job done. Unfortunately the NWTI system undermines his conviction by introducing a lose-or-break-even mentality.

Though it could be argued that the sensitive and critical nature of nuclear weapons justifies a rigid, zero-defects system of nuclear qualification, despite its adverse effects on the leadership climate, there are two problems with this argument. In the first case, it assumes that all the inspected units have nuclear weapons or will have them during the period in which the qualification remains valid; and further it assumes that a zero-defects rating is valid for the 18-month period prior to the renewal of qualification. These assumptions are flawed. The vast majority of nuclear-qualified units do not have nuclear weapons — only a small percentage of nuclear-qualified units Army-wide currently have custody of or work on nuclear weapons. A 6-month lapse of time between nuclear qualifications would be a more realistic, albeit still optimistic, interval rather than the current 18-month interval. As old personnel depart and new personnel arrive, as facilities and support arrangements change, and as commanders adjust their priorities, the NWTI results and the subsequent nuclear qualifications rapidly lose their validity. Based on current rates of personnel turnover and guidance contained in Army training literature on the necessity for frequent evaluation, six months would represent a length of time during which any commander could be about 80 percent certain that a unit could still "pass" an NWTI and renew its qualification.

Top right photo by 1LT Casey Brady; all other photos by Sam Orr.

In the second case, this argument for a zero-defects qualification system is that the *unit* must be qualified, rather than the *individuals* who occupy the nuclear duty positions within the unit. If a pilot in an aviation unit, with all of his critical responsibilities, fails to demonstrate the necessary proficiency in a check ride, only *he* loses his credentials — not his unit. Why should it be different for the critical responsibilities of nuclear qualification? Interestingly, special weapons ordnance personnel do have a system of certifying individual soldiers on individual weapons systems. In accordance with AR 700-65 and local implementing directives, company-level quality assurance officers evaluate and certify *the soldiers* on the weapons systems which they will be supporting.

Nuclear tasks

Many of the problems inherent in the involvement of a major commander and the necessity for a positive

evaluation also affect the third element of nuclear qualification — the focus on nuclear tasks. The TVI plus ARTEP contains more nuclear tasks than the NSI does; and all nuclear tasks are considered to be unit tasks, no matter how few individuals perform them. Yet another investigation of the NWTI reveals a discrepancy between the amounts of detail in various types of guidance. While an ARTEP spells out precise and detailed tasks, conditions, and standards, the rest of the NWTI only gives general subject areas instead of tasks and very general guidance instead of conditions and standards.

This lack of detail leads to several bad practices. The most common is to seek guidance in reference publications such as system technical manuals, regulations covering administration, and manuals on general subjects such as firefighting and emergency destruction. The result is the creation of a nearly open-ended number of tasks, since every sentence in the manual or regulation enjoys equal status as a task to be evaluated.

A rumor current on the USAREUR NWTI circuit holds that there are about 50,000 ways an ordnance company can flunk an NWTI. Whether or not this is true, there is certainly a perception that the chances for success are somewhat slim and that the chances for the ultimate accolade, "no comments, no deficiencies," are almost nil.

The lack of detail in elaborating what constitutes an NWTI, the consequent reliance on technical and administrative publications, and the high visibility of the NWTI place enormous power in the hands of the NWTI teams. That this power is so seldom abused is truly amazing and reflects great credit on the integrity of inspection teams. The number of "crusty old warrants" who insist that soldiers enter a truck hand-in-hand in order to prevent violations of the two-person rule is declining all the time. Nevertheless, the enormous power of the NWTI teams does confront inspected units with an ethical dilemma.

On the chance that the power could be abused, should units try very hard to gather information on NWTI teams and their idiosyncracies? How many times do statements like these surface: "Major A. is really hot on smoothing the wrinkles out of the tape," "Mr. B. probably won't call it failing unless it's really gross," "Lieutenant Colonel C. checks every single item on the form," "Put out doughnuts, but no cake or they'll think you're trying to snow them," and so on *ad nauseam*. One major headquarters even issued written guidance on how to handle NWTI inspectors.

Immediately after an NWTI outbriefing, the inspected unit usually prepares a report to its higher headquarters, ostensibly to share lessons learned; but the fact that this information normally focuses more on the final report than on the many helpful hints the inspectors passed along indicates that the purpose may be skewed more toward passing on intelligence about the NWTI team than toward sharing lessons learned.

Finally, the lack of ARTEP-style training standards through these inspections leads to the wide use of checklists. These range from rather comprehensive pre-NWTI checklists, used by a unit to prepare for an NWTI, to single function checklists used, for example, by a courier officer to conduct the courier officer's pre-movement briefing. This reliance on checklists leads quite naturally to the evaluation of procedures rather than results. Adding to this problem is the reliance on technical and administrative publications to describe the nuclear tasks, because these publications usually contain a short paragraph on purpose or objectives followed by many pages of procedures. The end result is an evaluation on *how* a unit gets the job done, rather than on *whether* a unit gets the job done. This type of evaluation in turn reinforces the inordinate power of the NWTI team, because the team can pass judgment on far more questions of procedure ("Did they do it right?") than they can pass judgment on results ("Did they do it?").

Inspection cycle

A final problem with the nuclear qualification system lies completely outside the three primary elements of nuclear qualification although this subject surfaced for a moment in the discussion of the positive evaluation. The current inspection cycle is just too unrealistic. An NWTI, for example, is mandated every 18 months and is preceded by a host of pre-inspections (seldom called that) by intermediate headquarters. Ostensibly, intermediate commanders are executing their responsibility to evaluate the status of training and nuclear surety within their command. However, the timing of these inspections, assistance visits, or surety evaluations suggests that they are really designed to prepare for the NWTI. The result is a sinusoidal level of nuclear proficiency, readiness, and surety which peaks at the NWTI, falls off rapidly, and gradually builds to another peak. The goal of some commanders is to make the peak high enough to "pass" the NWTI; others try to keep the trough from getting below the point of not being ready; still others try to achieve as uniform a level as possible. These varying goals reveal that the current inspection cycle simply does not promote a consistent level of readiness.

If there is a trough of proficiency below which a unit should not fall, then standards at the peak must be needlessly high. Acceptance of a sinusoidal standard centered on the NWTI creates the impression that inspection standards are unrealistically high now so that they will not fall to an unacceptable level later. On the other hand, if NWTI standards really are *the* standards, most professional artillerymen are placed in the uncomfortable position of having to acknowledge that they are not completely prepared for about 12 out of every 18 months. Few artillerymen admit this; most will confide that, "It'd be a lot different in a real situation."

Thus the inspection cycle creates a make-believe world for an inspection like the NWTI which is different from real world for war; it creates a system of double think and double standards which casts a pall of hypocrisy over the entire evaluation system.

A new approach

There is a real need for a new nuclear qualification system; and it ought to apply the Army's existing system of training and evaluation, which features precise, detailed, and comprehensive tasks, conditions, and standards; frequent evaluation; external evaluation by a commander one or two echelons above; evaluation of all training; training during all evaluations; and a focus on results, not failure. The new approach, in other words, is really not new at all — it is the approach that nonnuclear units in the Army have followed for some time. The simple truth is that, if the commanders of nuclear-capable units are doing their job, there is no need for chapter 8 of AR 50-5 and the confusion it generates. If chapter 8 were to disappear today, the only noticeable result would be a much more positive environment in nuclear-capable units. Battery commanders would go on training and evaluating their sections; battalion, brigade, and division artillery commanders would go on giving external evaluations to their units. If worse came to worse, a commander with a day-to-day nuclear mission would replace an unqualified individual, section, or unit until retraining could be accomplished. The only serious problem would occur with units running a peacetime nuclear storage site. The ARTEP conditions are written for wartime, but these units have very real peacetime tasks. There probably ought to be an ARTEP set of tasks, conditions, and standards written for the peacetime storage and maintenance mission. (A good part of this proposed ARTEP already exists in ARTEP 9-48 for ordnance battalions and the draft ARTEP 6-100 for NATO custodial units.)

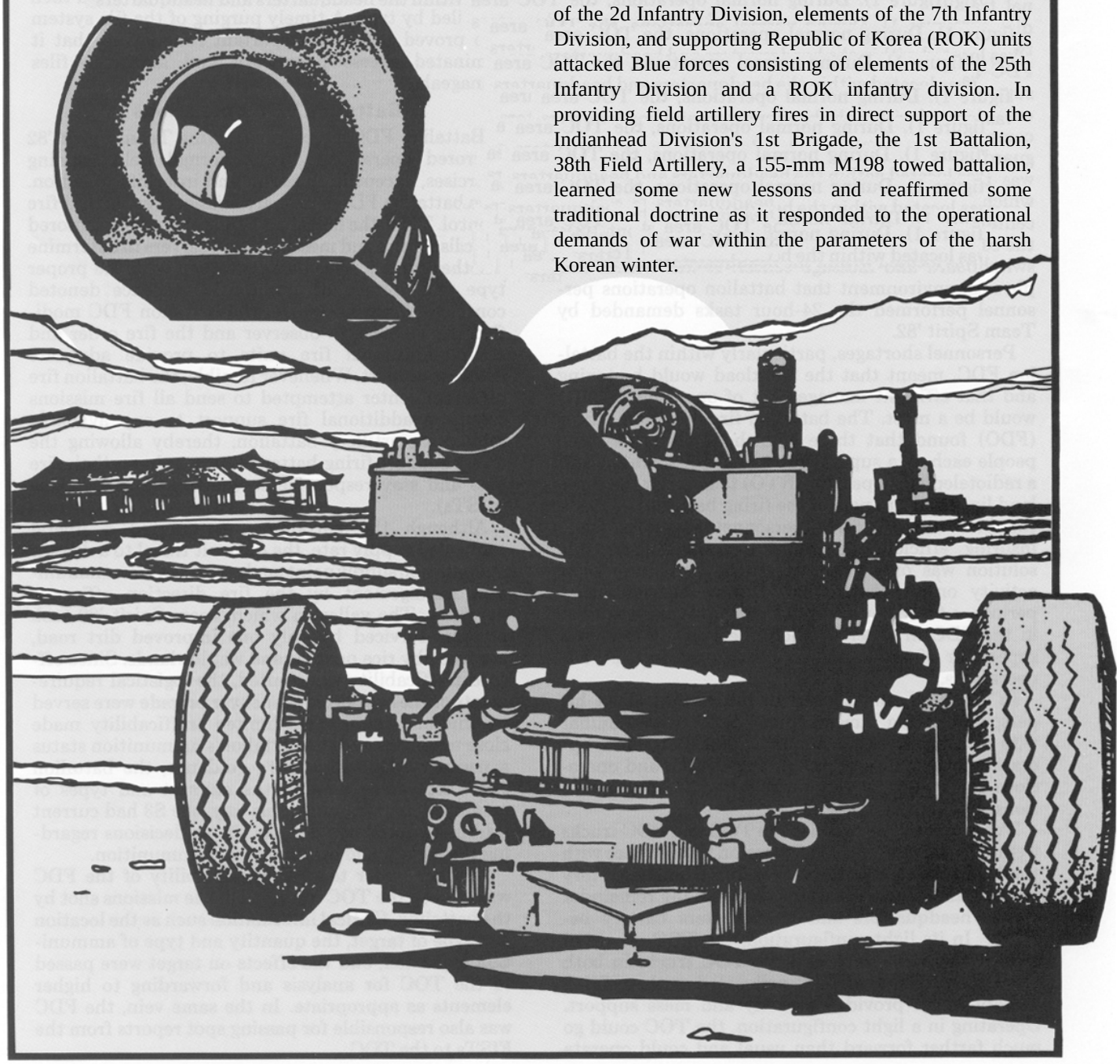
It is long past time for field artillerymen, as well as air defenders and engineers, to remove the impediments of the present system of nuclear qualification. The system is so confusing that it has created more harm than good. We need a new approach, and it is well within our grasp.

MAJ Michael J. Speltz, FA, a previous contributor to the *Journal,* is a graduate of the United States Military Academy, where he later served as an assistant professor of Russian. Assigned to the 1st Cavalry Division in both Vietnam and Fort Hood, Texas, he held many positions, including battery command. He was also an operations officer in the 59th Ordnance Brigade Liaison Element to Headquarters, Northern Army Group (NATO). Currently, he is the executive officer of the 557th US Army Artillery Group.

Dealing Steel in the Morning Calm

by Captain David J. Fitzpatrick

The word came from 1st Brigade headquarters in the area near Wonju, Korea, the Land of the Morning Calm: "At approximately 0530 hours, the Orange forces initiated a heavy artillery barrage in the 3d Brigade sector, followed by an armor and mechanized infantry assault on forward positions guarding the border." Thus commenced Team Spirit '82, an exercise in Korea, under the control of the Korean Army, in which the 1st Brigade of the 2d Infantry Division, elements of the 7th Infantry Division, and supporting Republic of Korea (ROK) units attacked Blue forces consisting of elements of the 25th Infantry Division and a ROK infantry division. In providing field artillery fires in direct support of the Indianhead Division's 1st Brigade, the 1st Battalion, 38th Field Artillery, a 155-mm M198 towed battalion, learned some new lessons and reaffirmed some traditional doctrine as it responded to the operational demands of war within the parameters of the harsh Korean winter.



Tactical operations center

The 1-38th FA's tactical operations center (TOC) was a lightweight, mobile one which adapted well to the demands of the terrain on the Korean peninsula (figure 1). During normal operations, the TOC area was located within the headquarters and headquarters battery perimeter and consisted of the battalion fire direction center (FDC) truck, the battalion TOC truck, and the communications tent. The 2 1/2-ton FDC and TOC trucks had specially constructed plywood shelters built onto the beds to provide efficient areas for operation. The two vehicles were parked rear-corner-to-rear-corner to facilitate personnel traffic between the tactical operations and fire direction centers. Additionally, a wire line between the two trucks allowed information to flow between the FDC and TOC and minimized the occasions when supervisors had to leave their duty stations. To enhance TOC security, the S3 surrounded the TOC complex with concertina wire and posted a 24-hour guard to walk the perimeter. Access to the TOC area was through a guarded, general-purpose small tent which doubled as the battalion communications center. The tent, which was manned by members of the communications platoon, contained the battalion switchboard and message center. It was within this physical environment that battalion operations personnel performed the 24-hour tasks demanded by Team Spirit '82.

Personnel shortages, particularly within the battalion FDC, meant that the workload would be taxing and that efficient management of operational shifts would be a must. The battalion fire direction officer (FDO) found that three eight-hour shifts of three people each — a supervisor, a FADAC operator, and a radiotelephone operator (RTO) to monitor the three land lines and fire nets of the firing batteries — made the best use of scarce personnel resources while insuring efficient tactical fire control. Yet, this solution was only effective during periods of light activity on the battlefield. During high intensity periods, a full complement of personnel was required in the FDC in order to allow the FDO to remain a supervisor of rather than a participant in the FDC operations.

In the TOC, the S3 had to insure that all of his personnel, from himself to the RTO, were familiar with report formats, communications-electronics operating instructions (CEOIs), target lists, and operations plans in order to man effective 24-hour operations.

Twice during the exercise the TOC and FDC trucks went forward in a light configuration to keep pace with the 1st Brigade's rapid advances into Orange territory (leaving the communications tent and the remainder of the headquarters and headquarters battery behind). In its light configuration, the TOC consisted of only the FDC truck and the TOC truck. In both these instances, the TOC collocated with a firing battery which provided security and mess support. Operating in a light configuration, the TOC could go much farther forward than usual and could operate effectively in the small position areas which the firing batteries had to occupy in the mountainous terrain between Wonju and the Han River.

One of the key evolutions in TOC operations was the implementation of a filing system for the operations orders, overlays, target lists, and significant volume of reports which flowed in and out of the TOC. During the first four days of the two-week exercise, these documents were kept in a file cabinet in chronological order; but, as paperwork began to accumulate, finding specific reports became more and more difficult, and so the necessity for a better filing system was clear to all. The system which proved to be successful required that all documents be filed by calendar days and then sub-filed by type. A timely purging of the file system also proved to be an important function in that it eliminated excess paperwork and kept the files manageable.

Battalion FDC operations

Battalion FDC procedures during Team Spirit '82 mirrored operations during normal field training exercises, except in duration and intensity of action. The battalion FDC's primary mission was tactical fire control. Thus, the battalion FDC personnel monitored all calls for fire and messages to observers to determine whether targets were being attacked with the proper type and volume of ammunition (silence denoted consent). When necessary, the battalion FDC modified the message to observer and the fire order and added additional fire units to provide adequate artillery support. Whenever feasible, the battalion fire direction center attempted to send all fire missions requiring additional fire support to any available reinforcing artillery battalion, thereby allowing the direct support firing batteries to remain on their fire nets and stay responsive to the fire support teams (FISTs).

Although the battalion was granted a liberal controlled supply rate, the difficult travel to a distant ammunition supply point made conscientious ammunition management by the fire direction officer a necessity. The valley in which Team Spirit '82 took place is serviced by only one improved dirt road, bordered by rice paddies and wet lowlands. Since off-road trafficability was limited, the logistical requirements of the supported maneuver brigade were served by this one route. This limited trafficability made close monitoring of the battalion's ammunition status a necessity. Given the S3's guidance, the battalion FDO kept close tabs on the amount and types of ammunition on hand. In this way, the S3 had current information and could make timely decisions regarding the pickup and distribution of ammunition.

Another major tactical responsibility of the FDC was to keep the TOC informed of the missions shot by the battalion. Critical information such as the location and type of target, the quantity and type of ammunition expended, and the effects on target were passed to the TOC for analysis and forwarding to higher elements as appropriate. In the same vein, the FDC was also responsible for passing spot reports from the FISTs to the TOC.

Fire support

Team Spirit '82 contributed greatly to the growth in efficiency and effectiveness of the battalion's fire support operations. During the first several days of the exercise, the 1-38th FA's mission was direct support to a composite ROK-US brigade; and it had an on order mission of direct support to the Indianhead Division's 1st Brigade. The difficult problems that arose from this unique organization for combat reaffirmed that a mission of direct support, on order direct support, is desirable only under the most severe of circumstances. Because the fire support personnel of the composite brigade were totally unfamiliar with the report formats and standing operating procedures used by the 1-38th FA, the information from maneuver elements did not always flow smoothly to the 1-38th FA TOC. It would have been beneficial if FSOs within the division artillery had been more familiar with the varying tactical standing operating procedures of the field artillery battalions. Another problem associated with the unfamiliar task organization was the additional responsibility of providing fire support for the 2d Division's rear area combat operations that were being handled by the 1st Brigade, which was in a reserve status at the time. The radio nets provided to the 1-38th FA were only adequate for providing fire support to the one composite maneuver brigade. The quick-fix solution was to place all of the 1st Brigade's

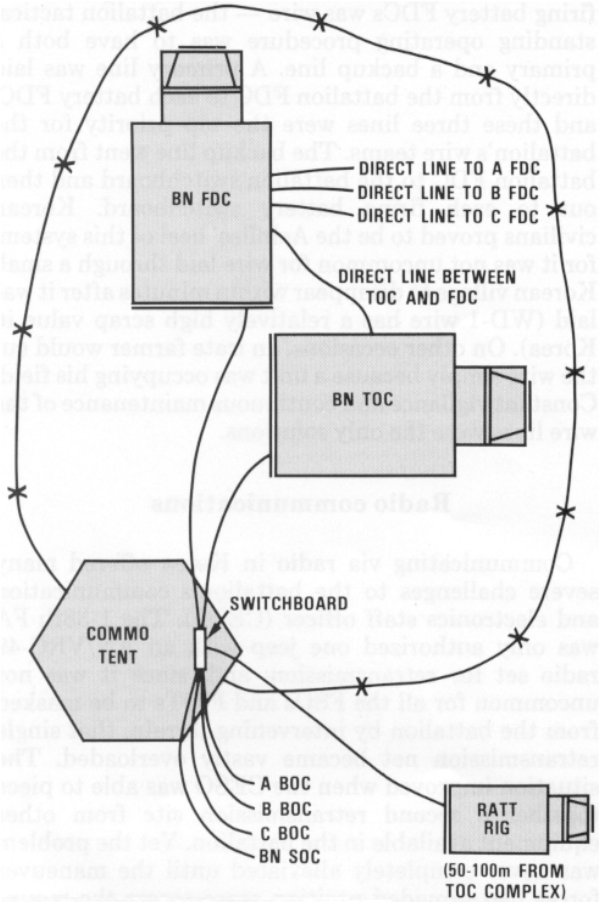


Figure 1. Battalion TOC configuration.

FISTs and FSOs on the 1-38th FA's command/fire direction (CF) 2 radio net — a move which provided the 1st Brigade with a quick fire channel for rear area support and maintained the 1-38th FA's access to the intelligence and operations being developed by the brigade it would soon support. The 1-38th FA's priorities in calls for fire were first the composite brigade, second the 1st Brigade, and third its own observers.

The entire fire support chain quickly learned the importance of proper and thorough fire support planning, although the initial days saw less than adequate interface between the maneuver leaders and their fire support coordinators. The first target lists provided by the FISTs and FSOs to the battalion were frequently faulty in that fires for intermediate objectives were not always properly integrated with the scheme of maneuver, target lists lacked pertinent data, and fire support plans from the brigade FSO were generally incomplete. Needless to say, such problems complicated the S3's efforts to plan adequate field artillery support for the maneuver brigade; but field experience brought knowledge and a continuous improvement in the quality of the fire support planning.

FISTs

The major problem encountered by FISTs during the exercise was their inability to communicate with the field artillery battalion FDC. Terrain in the area was one factor which will be discussed in greater detail later. The majority of the communication problems, however, were caused by the inexperience of the FIST chiefs. Over half of the FIST chiefs were lieutenants on their first assignments out of the Officer Basic Course. They had less than four months in the unit and were not yet totally familiar with the maintenance of proper communications with their supporting artillery. They often did not realize that they were out of communication until they needed immediate fire support. Here, too, experience taught them how to deal with this constant requirement.

Another problem was the FISTs failure to provide the 1-38th TOC, via their FSOs, with a continuous stream of spot reports. The FIST is the eyes and ears of an artillery battalion, and it must notify the fire support chain of tactical developments in its area of operations. Even a negative report is useful information. Without these reports, the operations section could not always accurately assess the current tactical situation. The difficulties which the 1-38th FA encountered with inexperienced FISTs perhaps support those who are in favor of putting new second lieutenants in battery XO and FDO positions and experienced first lieutenants in FIST chief assignments.

FSOs

As alluded to in a prior paragraph, the FSOs had to overcome some early deficiencies in their fire planning, particularly in the completeness of fire support annexes and target lists. It was not that the FSOs did

not know or attempt to follow directives and formats set forth in FM 6-20; rather, they discovered that they ought not to trade off too much completeness in the pursuit of timeliness. A fire support annex and accompanying target list which are received at the field artillery battalion TOC only 30 minutes prior to H-hour are practically useless, but an incomplete plan which arrives early causes more problems than it avoids. The FSOs of the 1-38th FA learned how to maintain this delicate balance as Team Spirit '82 progressed.

Team Spirit '82 demonstrated the truth of the brigade FSO's importance as the prime conduit for maneuver information to the field artillery battalion commander. The brigade FSO sent updated intelligence, maneuver spot reports, and frontline traces; and he kept prodding the battalion FSOs and their FISTs for battlefield information. Finally, the FSOs' intimate familiarity with the maneuver commander's scheme of maneuver made the allocation of available fire support assets more efficient. Fortunately, they aggressively sought the maneuver commanders' guidance; and, as a result, fire support was well integrated into the maneuver plan.

ROK-US coordination

Throughout Team Spirit '82, the 1-38th FA was supported by two successive reinforcing ROK field artillery battalions — an M101 105-mm battalion and an M114A1 155-mm battalion. Differences in equipment, doctrine, and language proved to be major coordination barriers.

The language barrier, which might at first glance seem to be the largest problem, was the easiest to overcome. The first ROK battalion to support the 1-38th supplied a liaison officer who had a working knowledge of the English language, which to a great extent lessened the effect of the language barrier. Unfortunately, the liaison officer sent by the second ROK battalion to support the 1-38th FA had no knowledge of English whatsoever; and so a KATUSA (Korean Augmentation to the United States Army) from the 1-38th had to act as a translator. As a matter of policy within the 2d Infantry Division Artillery, all battalion and battery FDCs have English speaking KATUSAs to handle just such a situation, as well as any Korean language transmissions which might come over the radios. Translation proved to be slow and tedious, but provided at least a workable solution.

Unfortunately, communications problems with the supporting ROK battalions were not as easily overcome. The liaison officers from both battalions came supplied with only an AN/PRC-77 radio. They brought no RC-292s or long wire antennas with which they could extend their radio's operating range. When possible, the battalion FDO allowed the liaison officer to use one of his section's RC-292s. A more serious problem was that the ROK artillery battalions did not have a retransmission capability. Thus, when the line of communications between the ROK battalion and its liaison officer was masked by a mountain, as it was with the 155-mm battalion which reinforced the 1-38th FA, communications broke down; and this situation went unsolved because the 1-38th FA's limited retransmission capabilities were needed to keep it in contact with its supported maneuver elements.

ROK doctrine in the area of communication responsibility proved to be an insurmountable problem, since their communications are established from lower to higher, and from reinforced unit to reinforcing unit — a doctrine which is exactly opposite to that of the US field artillery. The only wire-laying capability in a ROK artillery battalion lies within a firing battery, and those wire teams have only enough wire to lay to the ROK battalion TOC; thus, the battalion simply has no capability to lay wire to its reinforced units. Since the 1-38th FA could not receive any wire communications from the reinforcing ROK battalion, the timely delivery of *large* volumes of massed artillery fire was never realized during the exercise.

Wire communications

Communications, or the lack thereof, dictated the degree of success the 1-38th FA had in providing adequate artillery support during Team Spirit '82. The preferred means for tactical fire direction communications between the battalion FDC and the firing battery FDCs was wire — the battalion tactical standing operating procedure was to have both a primary and a backup line. A primary line was laid directly from the battalion FDC to each battery FDC, and these three lines were the top priority for the battalion's wire teams. The backup line went from the battalion FDC to the battalion switchboard and then out to each firing battery switchboard. Korean civilians proved to be the Achilles' heel of this system, for it was not uncommon for wire laid through a small Korean village to disappear within minutes after it was laid (WD-1 wire has a relatively high scrap value in Korea). On other occasions, an irate farmer would cut the wire simply because a unit was occupying his field. Constant vigilance and continuous maintenance of the wire lines were the only solutions.

Radio communications

Communicating via radio in Korea offered many severe challenges to the battalion's communication and electronics staff officer (CESO). The 1-38th FA was only authorized one jeep with an AN/VRC-49 radio set for retransmission; and, since it was not uncommon for all the FSOs and FISTs to be masked from the battalion by intervening terrain, that single retransmission net became vastly overloaded. The situation improved when the CESO was able to piece together a second retransmission site from other equipment available in the battalion. Yet the problem was never completely alleviated until the maneuver forces had provided position areas across the mountains to which the artillery could move.

Another challenge to radio communications proved to be the Team Spirit '82 CEOI, for it was developed for use only during the exercise. Unfortunately, it was in a format different from that of the 2d Infantry Division CEOI. Each major subordinate command was left to develop its own solution for interpreting the new CEOI, and no one solution was the same. As a result, there were times when units were literally and figuratively on different frequencies. These problems, however, proved to be a learning experience in establishing and maintaining communication between units as personnel at all levels cooperated in coping with the breakdown in radio communications.

Movement and positioning

As described earlier, Team Spirit '82 was conducted primarily in a narrow valley which had only one improved dirt road running the length of the valley. At the northeast end of the valley was the city of Wonju, an urban center of 75,000 to 100,000 people; and the Han River cut across the southwest end. In a situation like this, the battalion TOC had to control carefully all large-scale movements. Coordination with the maneuver brigade was a must, not only to insure that adequate fire support could be provided for maneuver elements during the movement, but also to avoid any traffic entanglements that could occur in an area of such limited trafficability.

The terrain in the mountain valley greatly limited the positioning of all five batteries. The landscape was dotted with rice paddies that were trafficable only under dry conditions. A sudden rain shortly after the 1-38th FA occupied dry rice paddies caused the battalion huge problems when it attempted to displace; the rice paddies had become a quagmire. There were small barley and garlic fields in which the batteries could be positioned, but seldom were the fields large enough for one full battery. It was not rare for a battery to have three guns in one field, three guns several hundred meters away in a second field, and the FDC with the battery headquarters in a third field several hundred meters behind the guns.

Because the 1-38th FA had recently converted to M198s, weapon range (30 kilometers) seldom came into play when considering whether or not to move the battalion. More often than not, communications difficulties dictated movement. As mentioned earlier, terrain often screened the maneuver elements from the artillery and greatly hindered communications. Though two retransmission stations were operational, both radio nets were extremely overloaded. Eventually, as the maneuver forces moved forward, the three firing batteries and the light TOC were able to move over the mountain which was obstructing communications.

COHORT operation

During Team Spirit '82, C Battery, 6th Battalion, 80th Field Artillery, moved all of its personnel and equipment from Fort Ord, California, to the Republic of Korea. During the exercise, this battery was attached to the 1-38th FA, but was sometimes under the operational control of the composite brigade. The 1-38th FA's logistical responsibility ranged from the simulated resupply of ammunition to the very real requirements of mess and maintenance. Particularly when C/6-80th FA was in the composite brigade area, this additional burden of resupply was exacerbated by the limited road network of the exercise area. When C/6-80th was attached to 1-38th FA, these logistical headaches diminished since the battery was much closer to its logistical base. There remained the problem of allocating a radio net to the battery, and the eventual solution was to place C/6-80th on the battalion operations/fire net so that it could respond to fire orders from the battalion FDO.

Team Spirit '82 taught 1-38th FA personnel valuable lessons and reaffirmed many aspects of traditional field artillery doctrine. They learned the importance of a filing system for TOC paperwork, carefully coordinated movements of the artillery and supported maneuver units, and stringent ammunition management. They affirmed the importance of proper fire planning methods and channels and the undesirability of a direct support, on order direct support, mission. New weapons, difficult terrain, different languages, unfamiliar organizations, and spirited but novice soldiers — all of these factors combined to challenge a battalion's ability to mold the doctrine to the demands of an extraordinary environment and operate effectively enough to win.

CPT David J. Fitzpatrick, FA, received his commission from the United States Military Academy. He served in a variety of field artillery assignments in the 1-82d FA at Fort Hood before joining the 1-38th FA, 2d Infantry Division Artillery, as the battalion fire direction officer. A graduate of the Field Artillery Officer Advanced Course, he is now the battalion fire direction officer of the 1-27th FA, 4th Infantry Division (Mechanized) Artillery at Fort Carson, Colorado.

View from the Blockhouse

FROM THE SCHOOL

Journal notes

Steadfast *Journal* readers will notice that two familiar sections — "FA Test and Development" and "With Our Comrades in Arms" — have blended into the structure of another old friend. Start looking in "Fragments" for news of the important developments in all of the Armed Services. There has been no change in "Right by Piece," "Incoming," or the full-length articles — they remain, as always before, the best places for concerned field artillerymen worldwide to communicate their news, questions, opinions, suggestions, and lessons learned.

Fire Support and Field Artillery/Senior Field Artillery Commanders' Conferences

The Field Artillery School plans to host both the annual Fire Support Conference and the Field Artillery/Senior Field Artillery Commanders' Conference during the next 12-month period. The Fire Support Conference dates are 15 through 17 November 1983, and the Field Artillery Tactics Instructors' Conference takes place over 17 and 18 November 1983. The Marine Corps Artillery Symposium, which is hosted by Fort Sill's Marine Corps representative, will occur in two periods: one on 14 November 1983 and the other over 17 and 18 November 1983. The Field Artillery/Senior Field Artillery Commanders' Conference is set for 9 through 13 April 1984.

It's not ET; it's ETM

To some it is called extension training material (ETM); to others, essential TACFIRE material. Either way, information is available to assist key TACFIRE trainers in their sustainment training programs. TACFIRE ETM is a multimedia program designed to utilize the TACFIRE computers and variable format message entry devices (VFMED) located at corps artillery, field artillery brigade, division artillery, and field artillery battalion levels. Soldiers in MOSs 13C and 13F can learn information pertinent to their duty positions or other TACFIRE duty positions, improve their skills for SQT, or sustain their knowledge using the training package provided by the US Army Field Artillery School.

Distribution of ETM to fielded TACFIRE units is made through the division artillery/field artillery brigade headquarters for further issue to their respective battalions; however, the ETM is distributed directly to the corps artillery headquarters. Instructional material includes printed lessons and magnetic tape cartridges for individualized and team training lessons.

New equipment training teams are visiting those units scheduled to receive TACFIRE in the near future. Fielding strategy includes not only an initial delivery, but also subsequent issues to a unit when a tape version change takes place. Any questions regarding TACFIRE ETM should be addressed to:

Commandant
US Army Field Artillery School
ATTN: ATSF-RTE
Fort Sill, OK 73503

Copperhead program

In the last few years, the Copperhead program has had its problems with issues of reliability and affordability. However, in December 1982, Copperhead achieved a .80 round reliability. Therefore, in April 1983, the Office of the Secretary of Defense certified the Copperhead program; and the Department of the Army inserted the program into the fiscal year 1985 program objective memorandum.

With this increase in Copperhead procurement, fielding remains on track in the Rapid Deployment Force-Army, where the Copperhead-G/VLLD weapon system has been fielded in the following units: the 82d Airborne Division, the 18th Field Artillery Brigade, the 24th Infantry Division (2 battalions), and the 9th Infantry Division. Fielding of Copperhead in the Rapid Deployment Force-Army will be completed in January 1984 when it becomes part of the 101st Airborne Division (Air Assault).

Listed below are the tentative fielding dates for some other units/major commands:

48th Infantry Brigade (one battalion)	July 1983
101st Airborne Division (Air Assault) (one battalion)	January 1984
US Army, Europe	September 1984
Eighth US Army	December 1985

Copperhead is here, and it provides the field artilleryman a capability he has never had before. It is truly a force multiplier.

TACFIRE Users' Conference

The US Army Field Artillery School will host the third annual TACFIRE Users' Conference at Fort Sill on the 17th and 18th of August. The theme for this year's conference will be "Train To Sustain." Units equipped with TACFIRE, or which will be so equipped within the next year, should plan for two representatives to attend.

A message will be sent to all TACFIRE-equipped units in the near future with additional information and instructions. This conference has demonstrated its usefulness in the past, and an even better conference is anticipated this year.

Documents available to researchers

The US Army Field Artillery School Morris Swett Library has made a variety of historically relevant documents available to researchers. DoD-account holders can order directly from the Defense Technical Information Center. Others can send a check for paper copies or microfiche to the National Technical Information Service, Springfield, Virginia, 22161. Since copying has been done from originals which date back as far as World War I, any guarantee of quality is impossible. The available documents include:

Document title	Assigned AD number	Pages	Paper cost
Air Effects Committee, 12th Army Group. *Effect of Air Power on Military Operations, Western Europe, 1945*.	ADA951843	240+	20.50
American Expeditionary Forces. Haute-Marne (France). *Proceedings of the Board of Officers Convened by General Headquarters, American Expeditionary Forces,* Chief of Artillery, Dec. 1919. (Hero Board).	ADA951864	840	53.50
"Annual Report to Chief of Field Artillery, Fiscal Year 1923-24," by Field Artillery Representative on Ordnance Committee (Including Historical Summary from the Armistice to Date, 1918-1924), Fort Sill, OK, 1924.	ADA951849	287	22.00
Chief of Artillery, American Expeditionary Force. *Report of a Board of Officers Appointed to Make a Study of the Experience Gained by the Artillery of the A.E.F. and to Submit Recommendations Based Thereon,* March 22, 1919. (Trench Artillery/Mortar Board)	ADA951851	163	16.00
Chief of Staff, War Department. *Report of a Board of Officers Convened to Make a Study of the Armament and Types of Artillery Materiel to be Assigned to a Field Army,* Washington, DC, May 23, 1919, (Caliber Board).	ADA951841	64	10.00
Operational Research Group. *Operational Research in Northwest Europe, the Work of No. 2 Operational Research Section with 21 Army Group,* June, 1944 - July, 1945.	ADA951850	255+	22.00
Task Force Resettlement Operation After Action Report, Fort Chaffee, AR, 7 May 1980-19 Feb 1982.	ADA121197	350(?)	26.50
U.S. Army Artillery and Missile Center, Museum. *Monthly Record of Units in Garrison or Attached to Fort Sill, March, 1869 - December, 1916,* Fort Sill, OK: the Museum, 1964. U.S. Army Field Artillery School. *History of the Field Artillery School,* Fort Sill, OK.	ADA951842	68	10.00
Vol. I - 1911-1942	ADA951855	254	20.50
Vol. II - WWII	ADA951856	299	23.50
Vol. III - 1945-1957	ADA951857	411	29.50
Vol. IV - 1958-1967	ADA951858	196	17.50

Training tape on terminal effects of FA munitions

A much requested TV training tape — TVT 6-112 — on the terminal effects of field artillery munitions has been completed by the Field Artillery School TV Branch and approved for distribution through all US Army training service centers by Tobyhanna Depot. This tape shows the terminal effects of high explosive, smoke (WP and HC), improved conventional munitions (ICM), dual-purpose ICM, FASCAM, and Copperhead projectiles, as well as MLRS rockets and Lance missiles. Copies of this tape should be available in August 1983 through local training aids service centers.

Exchange visit

A suggestion by the Commandant of the British Royal Artillery School during a visit to Fort Sill resulted in what is believed to be the first exchange between ceremonial units of the British and American Armies.

In September of last year, Warrant Officer 1 (Regimental Sergeant Major) William George Clarke of The King's Troop, Royal Horse Artillery, departed the United Kingdom for a 17-day stay with Fort Sill's Field Artillery Half-Section. Aside from the many hours of training with the Field Artillery Half-Section, Warrant Officer Clarke visited many of the historical sights in the Southwest, to include a saddle manufacturing plant in McKinney, Texas, and the Cowboy Hall of Fame in Oklahoma City. While working with the Half-Section, Warrant Officer Clarke participated in a Fort Sill monthly retirement ceremony, a post retreat ceremony, and two demonstrations at the Sheppard Air Force Base Open House in Wichita Falls, Texas.

The next part of the exchange took place in October when Sergeant First Class (Retired) Philip E. Wamer, Chief of the Field Artillery Half-Section, left for England to spend two weeks with The King's Troop, an extremely well-disciplined horse-drawn artillery unit. The King's Troop consists of approximately 200 soldiers and six gun sections; it also has its own veterinary, saddlery, and riding schools; tailor; blacksmith; and police and finance sections. Sergeant Wamer rode with The King's Troop to the Wormwood Scrubs Training Area to participate in a salute rehearsal; he also watched The King's Troop fire a Royal Salute on 3 November 1982 for the State Opening of Parliament.

The exchange program successfully enhanced the close ties that exist between American Redlegs and British Gunners. (1LT Steven Bailey, DPT, USAFACFS)

Regimental Sergeant Major William George Clark (left front) of The King's Troop rides with the US Army Field Artillery Half-Section. (Photo by SP4 Errold Bartley)

FTX added to Lance course

A field training exercise (FTX) has been included as part of the Lance Officer Course. The FTX incorporates all of the classroom instruction into a 24-hour hands-on exercise which includes plenty of maintenance. Students are required to work in the battalion and battery fire direction centers and to perform firing and assembly and transport operations using the M240 and M201 warhead sections.

The Lance Branch of the Weapons Department of the Field Artillery School is continually seeking ways to provide the best possible training for new Lance officers. Any recommendations or comments from the field regarding the field training exercise or any other Lance instruction should be addressed to:

Commandant
US Army Field Artillery School
ATTN: ATSY-WGL
Fort Sill, OK 73503

Overweights cannot attend school

Effective 15 April 1983, the revised AR 600-9, *The Army Weight Control Program,* specifies that officers in an overweight status are no longer authorized to attend professional military or civilian schooling, to include the Field Artillery Officer Advanced Course (FAOAC). In the recent past, an average of 15 to 20 officers have reported to FAOAC in an overweight status. Effective with FAOAC 4-83 (reporting date 17 July 1983), officers who report for FAOAC in an overweight status will not be permitted to attend the course, will be reported to MILPERCEN for reassignment, and will be subject to elimination from the Army. For further information contact the Field Artillery Branch Representative at Fort Sill, AUTOVON 639-5206.

New heavyweight truck

A new family of heavy trucks—the Heavy Expanded-Mobility Tactical Trucks (HEMTTs) — will be a key element in the sustainment of fire support on future battlefields.

Designed for tough jobs, a HEMTT is versatile enough to carry 10 tons of cargo at highway speeds or, with the same load, follow self-propelled weapon systems over rough cross-country routes. It has a straight, unarticulated frame; a 445-horsepower Detroit diesel engine matched to a Detroit Allison automatic transmission; and an eight-wheel drive, front-and-rear tandem axle arrangement rated at 38,000 pounds. Even though it is a large vehicle, the HEMTT can be transported in a C-130 aircraft.

In addition, human factor testing indicates that even a soldier who is below average in weight and height, male or female, can do all the tasks required of a vehicle operator, to include changing one of the 540-pound radial tires.

The HEMTT has several field artillery uses. For example, the HEMTT and the Heavy Expanded-Mobility Ammunition Trailer (HEMAT), employed together as an ammunition transport system in Multiple Launch Rocket System (MLRS) units, will allow the MLRS self-propelled launcher/loader to have 16 launch pod containers immediately available (each truck and trailer combination can carry eight launch pod containers of six rockets each). The rear-mounted crane on the M985 is rated at 5,400 pounds and can be used to unload both the vehicle and the trailer. With 18 trucks and 18 trailers in each MLRS battery, the unit has a one-sortie transport capability of 864 rockets. Both the M985 HEMTT and HEMAT are already being fielded to MLRS units.

M983 HEMTT.

As a field artillery ammunition resupply truck in cannon units, the M977 version of the HEMTT will have a 2,500-pound capacity crane that can load and unload whole pallets of ammunition. Cannon units will begin receiving these trucks in 1985. There are no plans, however, for trailers in cannon units because the cannon resupply effort involves much more off-the-road driving than does the MLRS support application; and a HEMTT loaded with ammunition will have a much better cross-country mobility and survivability without a HEMAT in tow.

M978 HEMTT fuel tanker.

In another field artillery application, CONUS-based Pershing II units will employ the M983 version of the HEMTT as a missile system prime mover. The M983 will have an on-board 30-kilowatt generator to provide system power and a 15,000-pound capacity crane for missile assembly operations. A backup hydraulic system for the crane will insure operational safety.

Two other adaptations of the HEMTT for field artillery use are the M978 1,500-gallon fuel tanker and the M984 wrecker. The M978 tanker will have more than twice the capacity of present tankers and an expanded mobility in line with the mobility of tracked vehicles of mechanized and armored units. The M984 wrecker will feature a heavy-duty crane and winch and will replace the 5-ton wreckers now found in self-propelled field artillery units.

M985 HEMTT with rear-mounted crane.

The longstanding disparity between the field artillery's ammunition supply rate and controlled supply rate is the result of force structure and equipment limitations. The 5-ton and GOER trucks simply do not have sufficient mobility, nor do the ammunition supply and transfer points have sufficient materiel handling equipment for speedy loading and unloading. The fielding of the HEMTT and HEMAT does not offer a total solution; but, combined with new field artillery weapons with increased rates of fire, new payloads, and the new configuration of cannon battalions from six- to eight-gun batteries, these new heavyweight trucks are truly force multipliers. (CPT Charles Wiley, DCD, USAFAS)

M977 HEMTT.

Feedback requested

The Weapons Department believes that Lieutenant Colonel (P) Peter D. Heimdahl's two recent *Field Artillery Journal* articles — "The Magic Formula" in the January-February 1983 edition and "Stretching the Circles" in the March-April 1983 issue — were eye-catching and interesting. The director of the Weapons Department invites the readership's responses to both presentations. Letters can be sent either directly to the *FA Journal* or to:

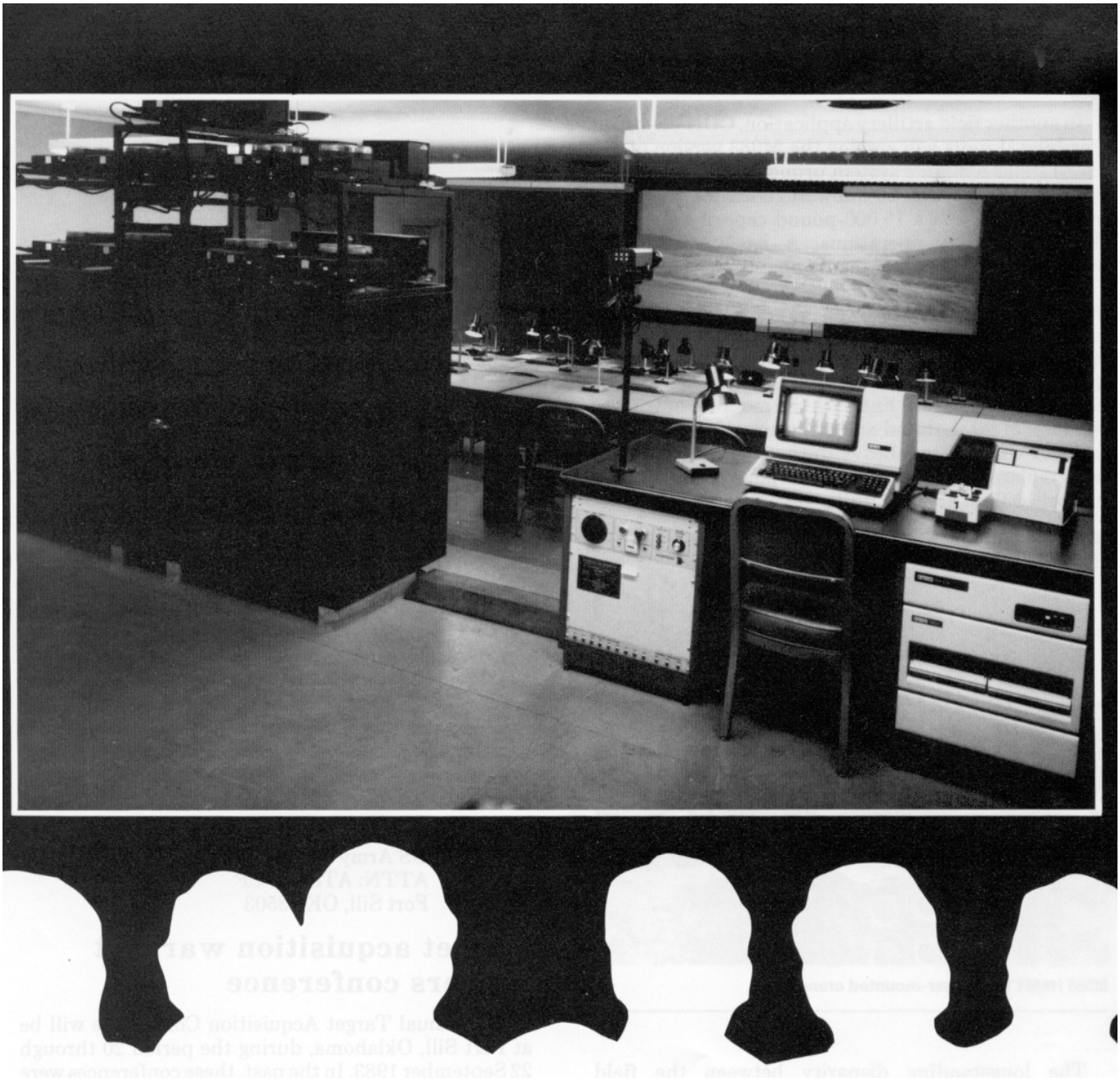
Commandant
US Army Field Artillery School
ATTN: ATSF-WCF
Fort Sill, OK 73503

Target acquisition warrant officers conference

The annual Target Acquisition Conference will be at Fort Sill, Oklahoma, during the period 20 through 22 September 1983. In the past, these conferences were directed toward battery commanders and other key target acquisition personnel within the fire support system; however, this year's conference is designed for meteorology and radar warrant officers. The Target Acquisition Department proposes to alternate the annual conferences each year between target acquisition commanders and warrant officers. The 1984 conference will be for commanders.

Funding for attendance is a unit responsibility. Point of contact for this year's conference is CW4 Milton, AUTOVON 639-2406/3264, Target Acquisition Department, USAFAS, ATTN: ATSF-FM, Fort Sill, OK 73503.

The Field Artillery Association Needs You!



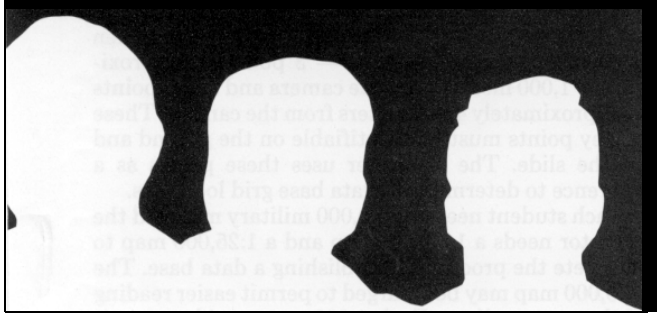
The training set, fire observation (TSFO) has come on scene in the nick of time. It is going to bring some welcome light to what has been a very cloudy training climate.

The trainer's problems

Field artillery units are preparing for combat in austere training environments that are characterized by dwindling training resources. Major constraints encountered by Active, Reserve, and National Guard units involve ever-increasing costs in ammunition, fuel, and repair parts required to conduct realistic training and maintain a high state of combat readiness. In the last three years the cost of 105-mm and 155-mm howitzer ammunition has increased in excess of 100 percent, while the cost of an 8-inch full-service round increased over 300 percent. As a result of this inflationary spiral, ammunition allocations for training

ONE MEAN SCREEN

by Captain Leroy L. Stevens



are being significantly reduced. Similarly, the costs of gasoline and diesel fuel have increased more than 200 percent during the same period and continue to rise. Using an average annual expenditure of 40,000 gallons of diesel fuel and 15,000 gallons of gasoline for training, a 155-mm field artillery battalion must pay at least $37,000 more for fuel today than it did in 1977. Repair parts now cost a 155-mm field artillery battalion $212,000 more than in 1977. Inflation continues to push the costs of training higher each year.

Not only does the increasing costs of ammunition, fuel, and repair parts impair training; but the battalion commander is often hampered by lack of adequate training areas. At many posts, especially outside the continental United States, suitable areas for training are too small to allow firing of service ammunition. Those areas that are suitable are often not available, are located more than 20 miles from home station, or will not allow routine firing of smoke or white phosphorus ammunition. With the increasing range and lethality of modern artillery ammunition, many units never fire improved conventional munitions, rocket-assisted projectiles, or higher charges with conventional high explosive projectiles.

All artillery units not only suffer from shortages of noncommissioned and commissioned officers, but all too frequently lose personnel to routine details. These details remove the soldiers and the trainers from the training mission. Often, a field artillery battery or battalion is unable to conduct effective training due to the lack of an acceptable training area or absence of its most valuable resource — its people.

The TSFO

There are many Army-wide efforts to reverse this adversity and improve training through greater use of training devices and simulators. The Field Artillery has taken advantage of recent developments in computer technology and, in June 1982, began fielding the training set, fire observation — the field artillery's newest observed fire trainer. The TSFO will greatly improve artillery training while minimizing the impact of training resource constraints. Two TSFOs are being issued to each Active Army division artillery and 14 sets to National Guard and Reserve units. The TSFOs will also be issued to Fort Richardson, Alaska; Fort Clayton, Panama; Camp Santiago, Puerto Rico; and the Field Artillery, Infantry, Armor, and Air Defense Artillery Schools. This extensive fielding will insure that fire support teams (FISTs) worldwide will have routine access to this realistic fire support training device.

The training set, fire observation, is a digital computerized device that simulates the visual and auditory effects of artillery. Its dynamic capabilities include the portrayal of several different terrain views as seen from a number of simulated observation post locations, a variety of targets, and simulated artillery bursts with a variety of fuze combinations. Major equipment components for the TSFO consist of 11 computer controlled slide projectors, 2 remote target control boxes, a projection screen (16 feet by 6 feet), 30 student stations, and an operator/instructor console with video display unit and keyboard. The TSFO is simple to operate and requires only one operator/instructor to train up to 30 personnel. The video display unit contains all information needed by the operator to conduct the fire mission, including actual grid location. The software program is arranged to prompt the required input from the operator. The contractor provides 40 hours of training for operators at designated dates and locations throughout the United States. Additionally, the contractor provides assistance and maintenance throughout the life of the TSFO.

Slide projectors

The 11 computer controlled slide projectors include a terrain projector, six burst projectors, a flare projector, a smoke projector, and two target projectors.

- **Terrain** — The terrain projector contains eight slides which allow training to be conducted with either a daylight view, a nighttime view, or a daylight view with a superimposed magnetic compass reticule for each terrain scene depicted.
- **Burst** — The six burst slide projectors project onto the screen the burst and impact simulation of up to one 8-gun 155-mm howitzer battery at one time. However, the TSFO has the ability to simulate up to four 8-gun, 155-mm batteries from separate grid locations. Realistic time of flight (TOF) is portrayed, although TOF may be set as low as one second. Additionally, realistic flash-to-bang time is simulated by electronically produced sounds. Each of the six slide projectors either depicts a ground burst, a concealed burst (depicted by a rising smoke column), or an airburst with shrapnel (either 10, 20, or 30 meters below the burst).
- **Smoke** — The smoke projector, used in conjunction with the burst projectors, illustrates the point of impact of the smoke cannisters. The smoke realistically builds up to produce the desired smoke screen. Buildup time is approximately 60 seconds or may be set as fast as 5 seconds. Realistic wind conditions can be simulated. Wind speed may be set in 1-mile-per-hour (mph) increments and wind direction in 1-mil increments.
- **Target** — The target projector can depict either an enemy stationary firing target or a moving target, to include a stationary machinegun position, a stationary antitank gun, or a stationary or moving vehicle.

Remote target control boxes

All target activity is controlled through the two remote target control boxes. The TSFO operator can superimpose a machinegun onto a stationary tank to make it appear to be firing, as well as use both target control boxes to depict two active machinegun positions. He can place all targets anywhere on the terrain view and can use four separate target sizes for realistic target/range depiction. The appropriate ballistic sounds for firing targets are audible and correlate with the preselected range to the target. A series of up to four moving target scenarios may be recorded and played back separately by the computer.

Training

The use of the TSFO will upgrade the training and evaluation of fire support teams and forward observers in all Active, Reserve, and National Guard field artillery units. Imaginative classroom layouts, tactical communication equipment (to include the digital message device), and prerecorded sounds of battle can add even more realistic training with the TSFO. In addition to being a great training device for just the field artillery, the TSFO can also be used in combined arms training in conjunction with command post exercises, battle simulations, and wargames. The maneuver commander can use terrain scenes of any training area or actual battle position to train his commanders and platoon leaders in the development of battle plans. At the same time, other combat support elements can develop their plans to support that scheme of maneuver. For example, the TSFO is useful in training on obstacle plans and direct fire plans. Obviously, the TSFO facility offers significant flexibility to commanders in training their combined arms teams.

Data basing

Perhaps the TSFO's most promising capability is its capacity to accept any computer program on a standard 8-inch floppy disk. The Field Artillery School is currently developing the concept of allowing units to obtain additional terrain scenes. A TSFO operator would be able to produce his own data base for any terrain scene he chooses. Producing a data base is a relatively simple procedure which requires a minimal amount of input information.

To obtain the terrain scene view, the operator takes a 35-mm color slide photograph using a standard 35-mm camera with a 40-mm lens. Several pictures of the area from different camera settings will insure that a clear slide is available. A fifth-order survey team then surveys the camera position — 3 points at approximately 1,000 meters from the camera and also 3 points at approximately 4,000 meters from the camera. These survey points must be identifiable on the ground and on the slide. The computer uses these points as a reference to determine all data base grid locations.

Each student needs a 1:50,000 military map and the operator needs a 1:50,000 map and a 1:25,000 map to complete the process of establishing a data base. The 1:25,000 map may be enlarged to permit easier reading of the contour lines. Each 1,000-meter grid square is divided into 50-meter squares, and the mean altitude of each 50-meter square is entered into the computer so that the moving targets will appear to climb a hill instead of moving through the hill. Observer locations are then entered to allow the computer to orient itself to the terrain.

Visibility data are the next type of input. This data identifies to the computer those areas not visible to the observer, to include areas behind building, in treelines, and behind hills. When a round lands in one of these areas, the observer will see only a rising smoke symbol, not the high explosive burst.

Battery locations are entered last, thus completing the data base process. The TSFO is now ready to train forward observers. Operators from different units can trade terrain scenes with other units to save each other time and effort.

The Field Artillery School will have resolved the procedure for producing additional terrain scenes by the fall of 1983 and will then be able to provide the methodology to units in the field.

"The use of the TSFO will upgrade the training and evaluation of fire support teams and forward observers in all Active, Reserve, and National Guard field artillery units."

Maintenance

Operator maintenance consists of cleaning the equipment, alignment of the projectors, and replacement of light bulbs and fuses. The contractor is ultimately responsible for all other maintenance functions. Each user unit will be assigned a contractor telephone number for reporting equipment difficulties. If the TSFO malfunctions, the operator refers to the guide in the user's handbook to troubleshoot the problem; if he is unable to correct the fault, the operator calls the closest contractor representative.

Personnel requirements

Here is the way some of the units receiving TSFO assign personnel to manage the system. The division artillery S3 office is assigned the overall management responsibility for the TSFO facility, and his office schedules units for training with the TSFO. Each field artillery battalion designates at least one individual as the TSFO instructor for that battalion. Selected instructors are chosen by the division artillery S3 to train maneuver, Army Reserve, or National Guard units.

Closed loop concept

The Field Artillery School is developing a closed loop training configuration that will utilize the TSFO in training the total cannon field artillery team of forward observer, fire direction center, and howitzer crew. In this closed loop concept, the fire direction center and the howitzers (or M31 indirect fire trainer) could be located in any part of the cantonment area or local training area. The concept would stress normal radio or wire communication from the forward observer in the TSFO facility to the fire direction center. Firing data developed by the fire direction center would be placed on the howitzers. The howitzer crew would load and fire a limited range projectile like the shootable practice round being developed for the Field Artillery. The data fired by the howitzer would then be recorded by a howitzer-measuring device (e.g., the firing battery trainer being developed for the Field Artillery) which then computes a "did hit" grid coordinate that would be displayed to the observer on the TSFO screen. This training sequence would continue until fire for effect and mission termination. The closed loop training concept is a viable alternative to live fire training with full service ammunition without degrading combat readiness.

Enhancement initiatives

The Field Artillery School has initiated actions to improve the TSFO based on early feedback from the field. An additional training capability to simulate target engagement with improved conventional munitions and with the G/VLLD-Copperhead system has been proposed and is pending approval for funding by the Department of the Army.

There are many different ways the TSFO can be used to train field artillerymen and maneuver personnel. Suggestions from the field on how to expand the use of this most valuable and innovative training device will help the entire Field Artillery Community realize its potential.

CPT Leroy L. Stevens, FA, received his commission through the ROTC at Kemper Military School and is a graduate of the Officer Advanced Course. He has served as an FO, an FDO, and a battery XO in the 2d Battalion, 33d Field Artillery. Captain Stevens is a member of the staff of the Directorate of Training Developments, US Army Field Artillery School, where he is the project officer for field artillery training devices and battle simulators.

Right by Piece

NOTES FROM UNITS

Yama Sakura III

FORT ORD, CA — Members of the 7th Infantry Division Artillery recently participated in the combined US Army/Japanese Ground Self Defense Force (JGSDF) Command Post Exercise Yama Sakura III at Camp Higashi Chitose, Hokkaido, Japan. Yama Sakura III, which was a free play War Eagle/First Battle controlled exercise, is the third in a series of exercises involving US participants from the IX Corps, 7th and 25th Infantry Divisions, XVIII Airborne Corps, 197th Infantry Brigade, Air Force, and 7th Fleet, as well as Japanese air-ground and Marine self-defense forces.

The 7th Division Artillery officers and NCOs provided the nucleus, and majority, of the division and brigade player cells. These participants were commanded by Colonel Fred A. Gorden, the division artillery commander.

Yama Sakura III was designed to identify critical host nation logistical support, develop intelligence exchange procedures between US and Japanese forces, exercise mutual fire support planning and combined fire support operations, and develop procedures for targeting and conduct of deep attack for the AirLand Battle.

The exercise was preceded by weeks of maneuver and War Eagle/First Battle training at Fort Ord, coordination with the JGSDF and IX Corps staffs, and coordination among 7th Division staffs. The 7th Div Arty was responsible for the coordination of pre-exercise training, as well as orchestration of the division operations orders, between the 7th Division and the National Guard and Army Reserve participants from California, Oregon, and Kansas who were also filling positions on the 7th Infantry Division staff.

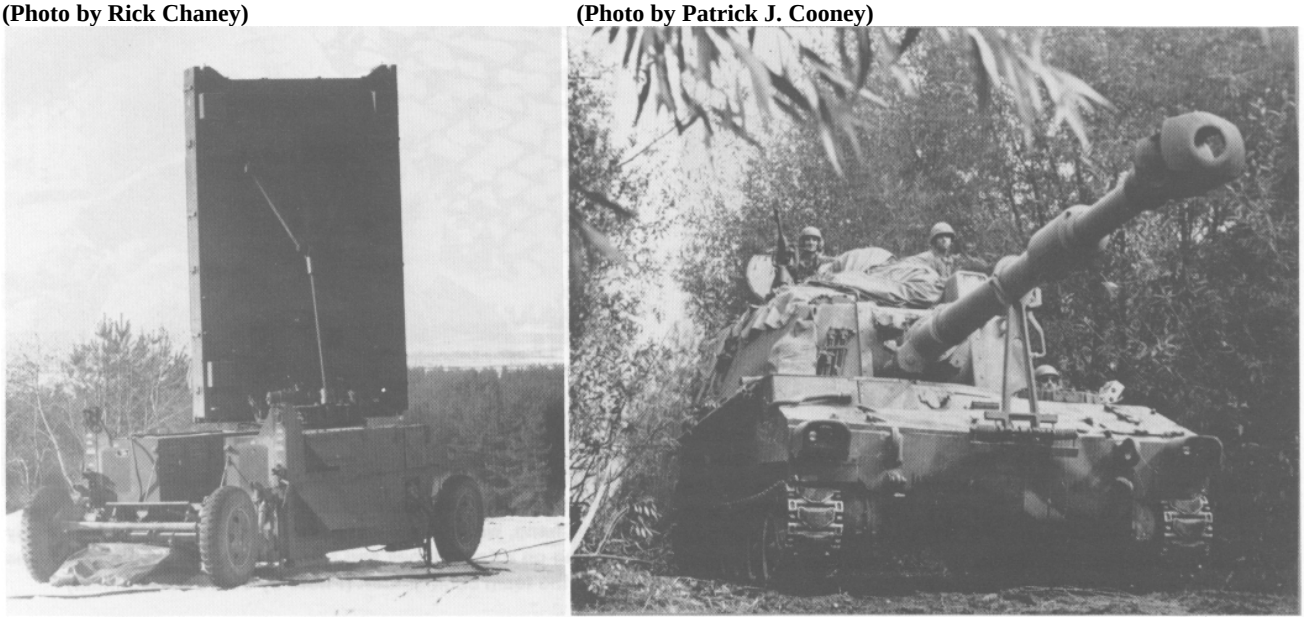
Highlights of the exercise included a passage of lines through a Japanese division, airmobile operations, and extensive logistics coordination with the Japanese. Coordination was an ongoing process between the fire support elements of the 7th Division and the Japanese divisions and became especially critical during the passage of lines and airmobile phases of the exercise. Liaison officers utilized by both US and Japanese forces were crucial in both the planning and execution phases of these operations.

The exercise was a tremendous success, and the 7th Division Artillery was again chosen to represent the 7th Infantry Division for Yama Sakura IV at Fort Ord in May 1983. (CPT Robert A. Brown, 7th Infantry Division Artillery)

CPT Steven Best (standing), 7th Infantry Division Artillery, briefs the 2d Japanese Division commander and his staff on the division fire support plans.

FORT CARSON, CO — National Guardsmen from the 1st Battalion, 168th Field Artillery, in North Platte, Nebraska, recently deployed to Fort Carson, Colorado, to join the 1st Battalion, 20th Field Artillery, in field training exercises. The Guardsmen were required by the training scenario to assume control of the M109 155-mm howitzers, equipment, and mission of an active duty field artillery battery that had been wiped out by a chemical attack. (Photos by 1LT David Burns)

(Photo by Rick Chaney) (Photo by Patrick J. Cooney)



ANSBACH, GERMANY — Field artillerymen of the 1st Armored Division Artillery are making use of their Firefinder radar (left) in training exercises like REFORGER. The howitzer crew pictured on the right is from C Battery, 6th Battalion, 14th Field Artillery.

TACFIRE seminar

HANAU, GERMANY — With TACFIRE well-known among field artillerymen but still a mystery to some maneuver commanders, the Redlegs of the 3d Armored Division Artillery recently presented a "how-to" seminar entitled "TACFIRE for Commanders" at Hutier Kaserne, Hanau. The purpose of the hands-on demonstration was to explain to the division's maneuver commanders how TACFIRE could be used to enhance employment, intelligence, command, and control of the division's field artillery assets. invitees included the commanding general, both assistant division commanders, brigade commanders, the division support command commander, and all battalion commanders.

After a brief introduction by Colonel Robert Rosenkranz, the division artillery commander, a round robin consisting of five stations was conducted. At each station, the commanders received a 10-minute briefing and demonstration.

Number	Station	Host unit
1	Div Arty TOC Fire support element AN/TPQ-37 radar	HHB, Div Arty F-TAB
2	Battalion TOC (FDC, O&I, and S2)	2-27th FA
3	Battery FDC (battery display unit)	1-49th FA
4	FSO (brigade and battalion)	2-6th FA
5	FIST and the digital message device	2-3d FA

The idea underscoring all of the briefings and demonstrations was the capabilities of TACFIRE compared to the previous manual methods.

The 3d Armored Division Artillery received TACFIRE during the fall of 1982 and is making an effort to introduce maneuver commanders to the latest innovations that are becoming available to the Field Artillery Community. The 3d Armored Division Artillery conducted its first live-fire exercises with TACFIRE in November and December at Grafenwoehr; and the 2d Battalion, 3d Field Artillery (155-mm, SP), and the 1st Battalion, 40th Field Artillery (8-inch), returned in March 1983 to conduct their first ARTEPs with TACFIRE.

BAD KREUZNACH, WEST GERMANY — Private First Class Robert W. Newberg of Battery C, 1st Battalion, 83d Field Artillery, holds up the remainder of a powder charge that had been cut and used to fire a 155-mm howitzer round during the battery's density field training exercise. (Photo by Timothy Canny)

Sergeant Max Miller (left) and First Lieutenant Dennis Hardy, Battery B, 1st Battalion, 127th Field Artillery, KSARNG, operated the fire direction center which plotted the fire missions for the single M109 155-mm howitzer "battery." An additional FDC was used to plot the 81-mm "section" and the 107-mm "platoon." Due to the compressed battle position, this single center served both mortars. (Photo by COL Ernest G. Peck)

Tornado I

SALINA, KS — In conjunction with the Army Training Board, Department of Army Ranges and Training, and the Army Mobilization and Readiness Region VIII, the Kansas Army National Guard recently conducted a fire coordination exercise (FCX), called Tornado I, at Nickell Barracks Training Center, Salina, Kansas. Tornado I was a company team-level FCX conducted on a one-tenth scale range (500 meters deep and 100 meters wide) that employed trainfire mechanisms, subcaliber weapons systems, and the multiple integrated laser engagement system (MILES).

During the training sequence of Tornado I, event after event was presented to the company team. Through spot reports from his subordinates, the team commander evaluated the situation and had to initiate the appropriate response. In sizing up the enemy threat within each event, the team commander could select methods of engaging the enemy with mortars,

The long-range indirect fire for the combined arms team was portrayed by one M109 155-mm howitzer from Battery B, 1st Battalion, 127th Field Artillery, KSARNG. This well-camouflaged tube was also employed in a subcaliber mode. The position of the mortar carrier in the foreground emphasizes the compressed scale of the battle positions. (Photo by COL Ernest G. Peck)

Next to the team commander, the FIST chief, Second Lieutenant Lex Chang, was the busiest exercise player. He was frequently talking on three phones and two radios while taking directions from the team commander. (Photo by SSG Jeff Behuniak)

artillery, armor, TOWs, Dragons, or air support. The artillery, armor, and mortars employed subcaliber devices while the TOW and Dragon used the MILES. The air support was provided by a remotely controlled model aircraft.

Second Lieutenant Lex Chang, FIST chief for Tornado I, felt the exercise highlighted the need to react quickly to any contingency. "You really have to know your job. If it takes five minutes for you to get a shot off (from sighting to engagement), the enemy can overrun you in that time," Chang said.

The use of a one-tenth scale range for fire coordination training makes it easier for commanders to acquire hard-to-come-by range space. Another advantage is the financial savings. For example, a tank main gun round costs over $200, but the cost of a 5.56-mm ball tracer is only about 25 cents; a 155-mm projectile costs over $1,000, but the cost of a 14.5-mm round for the subcaliber trainer is about $4.(SSG Jeff Behuniak, Kansas Army National Guard)

FORT ORD, CA — Soldiers of Battery C, 6th Battalion, 80th Field Artillery, practice firing at Fort Ord prior to deploying to Korea. (Photo by Tim Guthrie)

Tubes ashore

BEIRUT, LEBANON — For more than a month, the Marine cannoneers from Golf Battery, Battalion Landing Team 3/8, were in combat-stricken Beirut, serving as craftsmen without the tools of their trade, which were aboard the *USS Shreveport*. But those tools soon came out of their seagoing boxes when six 155-mm howitzers were ferried ashore to the awaiting Marines.

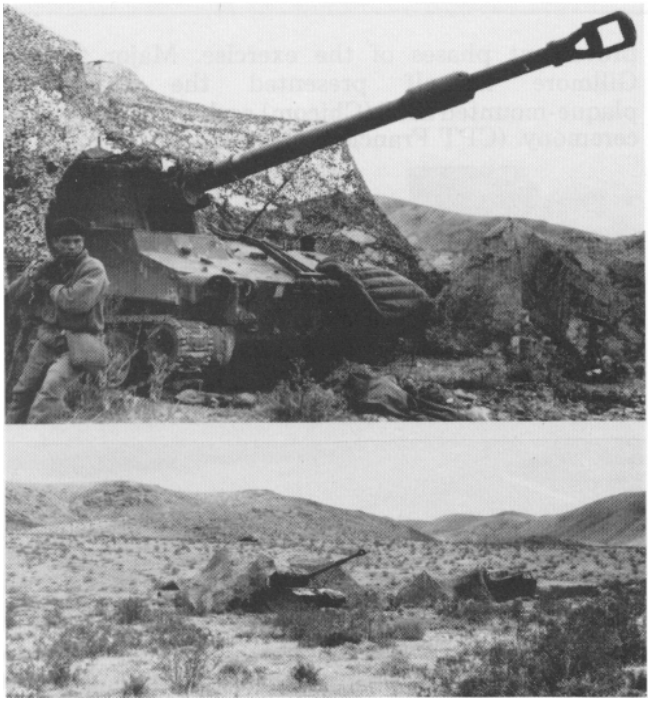
Before the armament was rolled inland, the Marine field artillerymen had been serving as infantrymen with the battery employed as a provisional rifle company. Golf Marines spent long hours in the mud and rain, standing guard along the Marine perimeter, manning posts, and providing additional security for Leatherneck headquarters at the International Airport.

When the guns arrived at the battery compound, it seemed as if the anxious men were reunited with long lost friends. They ran to the big guns and began wiping off the salt water and dust from the dismal journey inland.

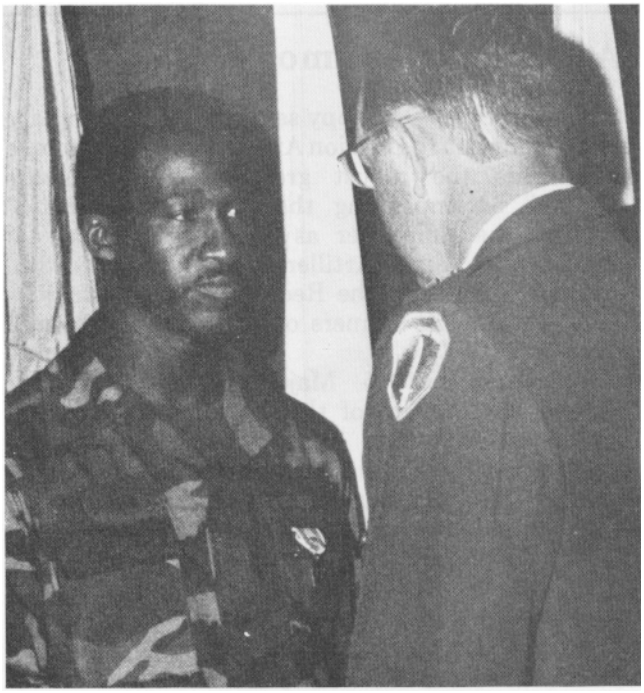
For the time being, the weapons will be housed near the unit's current command post. As soon as a new training site is selected, they will be moved into new positions and training exercises will begin.

"We will start our normal training cycle immediately," said battery commander Captain Terry Doran. "The men will begin practicing reconnaissance, selection, and occupation of positions. From now on, daily schedules will entail fire direction control drills, moving, setting up, and actually laying the gun battery."

Personnel from 3d Battalion, Eight Marines, set up one of the six 155-mm howitzers deployed in Beirut, Lebanon. (Photo by Sergeant Christopher Grey.)



FORT IRWIN, CA — The 1st Battalion, 29th Field Artillery — the "Red Barons" — from Fort Carson, Colorado, supported the 4th Infantry Division (Mechanized) 2d Brigade Task Force during the Highland Thrush exercise at the National Training Center at Fort Irwin. (Photos by SFC Marshel R. Thompson)



FORT BENNING, GA — First Sergeant James C. McKinney, a field artillery instructor at the US Army Infantry School, is congratulated by the School's Commandant, Major General Sam Wetzel, for being named the senior NCO instructor of the year for 1982. This is the second year in a row that a field artilleryman has received the award.

FORT ORD, CA — Soldiers from Battery C, 6th Battalion, 80th Field Artillery, pick up the first of their M198 howitzers. This COHORT unit recently deployed to Korea and became Battery B, 1st Battalion, 38th Field Artillery ("Steel"). (Photo by Tim Guthrie)

FORT KNOX, KY — Sergeant Daniel Wilson and Sergeant John E. Ferguson, 3d Battalion, 92d Field Artillery, United States Army Reserve, Akron, Ohio, prepare their howitzer for firing during a training exercise at Fort Knox, Kentucky. (Photo by SGT Dave Saunders)

"Automatic Gillmore"

FORT ORD, CA — Snappy saluting is commonplace among 7th Infantry Division Artillery soldiers, but one often hears the robust greeting of "Automatic Gillmore" accompanying the salute. "Automatic" identifies the cannoneer as a member of the 2d Battalion, 8th Field Artillery, the Automatic 8th. "Gillmore" identifies the Redleg as a member of A Battery, 2-8th FA, winners of the coveted Gillmore trophy.

In December 1975 Major General (Retired) Gillmore, commander of the 7th Infantry Division Artillery from 1949 to 1950, presented a captured North Korean rifle to serve as an annual award honoring the accomplishments of the 7th Division Artillery cannoneers in achieving combat readiness. The annual competition for this honor recently took place at Camp Roberts, California. Using ARTEP standards, the division artillery conducted a rigorous battery-level field exercise for the various battalion representatives. Alfa Battery was victorious and retained the Gillmore Trophy for the second year in a row. The winning battery is a COHORT unit and won the competition although its members had only four months together. They made a strong showing in the night occupation, hip shoot, and position improvement phases of the exercise. Major General Gillmore himself presented the trophy, a plaque-mounted SKS (Chicom) carbine, at the awards ceremony. (CPT Francis G. Maronski)

Retired Major General William N. Gillmore (center) presented the coveted Gillmore cup to A Battery, 2d Battalion, 8th Field Artillery, winner of the seventh annual Gillmore competition. General Gillmore started the competition in 1975 while he was commander of the 7th Infantry Division Artillery. The competition determines the best battery of the year by a series of combat readiness tests. (Photo by Larry R. Willens)

Canadian and American units trade places

FORT CAMPBELL, KY — As part of the small unit exchange program, Battery C, 1st Battalion, 321st Field Artillery, Fort Campbell, Kentucky, recently traded places with Battery X, 5th Light Artillery Regiment, from Valcartier, Quebec, Canada, for almost a month of training.

The Canadian battery completely took over C Battery's equipment; and, with the assistance of Battery A, 1-37th FA, practiced firing the 105-mm and 155-mm howitzers, driving the US vehicles, and operating US radios.

The Canadian officers and section commanders were given two days to qualify as safety officers to meet US safety regulations before going to the field for a three-day field training exercise. Just after the three-day exercise, the Canadians returned to the field to support the 1st Battalion, 506th Infantry, in their ARTEP. In addition to their classroom instruction, the Canadians spent a day rappelling at the Air Assault School. (Story and photos by SP4 Tom Jackson)

Staff Sergeant Terry Looney, 1st Battalion, 321st Field Artillery, briefs Canadian field artillerymen on how to rappel from the Air Assault tower and from helicopters.

Canadian Gunner Bertrand Ramallard from Battery X, 5th Light Artillery Regiment, awaits firing orders.

Nebraska NG practices rail loading and unloading

NORTH PLATTE, NE — The field artillery's effectiveness as a fighting unit may be determined by how quickly it can move equipment to a battle site. So that was the focus of field artillerymen in a recent Nebraska Army Guard mobilization skills test.

The exercise involved loading and unloading all the equipment on which Nebraska Guardsmen train — from quarter-ton trucks to self-propelled howitzers — at railroad sidings around the state. It was the first rail-loading exercise for the Nebraska Army National Guard; and Lieutenant Colonel William E. Whitney, representing the state's logistics director, indicated that the weekend test was beneficial.

Whitney said it demonstrated that the Department of the Army transportability guides are not adequate and urgently need to be updated. At the same time, he praised the "great level of expertise and talent among our enlisted personnel, sergeants, and junior officers. When a problem came up, someone knew how to solve it." *(On Guard,* February 1983)

Nebraska Army National Guard field artillerymen of the 1st Battalion, 168th Field Artillery, practice blocking and bracing during a recent mobilization rail-loading exercise at North Platte, Nebraska. (Photo courtesy of Battery B, 1-168th FA, NEARNG)

Photo by SP4 Errold Bartley.

From NATO to You

by Lieutenant Colonel (Retired) Charles W. Montgomery

Within the North Atlantic Treaty Organization (NATO), the Military Agency for Standardization is charged with insuring the timely development of standardization agreements (STANAGs) between the 16 member nations. These STANAGs allow the effective operations of elements from several nations in a common military effort. The NATO Army Board performs this development function for Army equipment and operations. It interfaces with the Air and Navy Boards where necessary. Assisting the Army Board in meeting its responsibilities are working parties and panels of experts. The US Army Field Artillery School participates as the US Army Training and Doctrine Command's representative in some of these groups to assist in developing draft artillery STANAGs. Since 1970, numerous artillery STANAGs have been drafted, ratified, and implemented in US manuals and other texts.

Recently, the Artillery Working Party was tasked by the Army Board to develop a workbook publication which would cover, in a format suitable for the users, the standard artillery procedures. This publication has a single custodian authoring agent — the United Kingdom — but other NATO nations have been tasked to provide selected chapters for the workbook. Each chapter will cover one or more STANAGs (the table of contents is listed in table 1). The workbook will give the reader a single text that covers all ratified STANAGs pertaining to artillery procedures.

Table 1. STANAG workbook table of contents.

Chapter	Title
1	Introduction.
2	Artillery Terms/Definitions.
3	Fire Discipline.
4	Laser Safety/Procedures for Artillery.
5	Radio-Telephone Procedures for the Conduct of Artillery Fire.
6	Interoperability of ADP Systems.
7	Target Numbering System (Non-Nuclear).
8	Fire Planning.
9	Tactical Tasks/Responsibilities for the Control of Artillery.
10	Fire-Support Coordinating Measures.
11	Counterbattery/Intelligence Reports.
12	Meteorology.
13	Battlefield Illumination.

• **Chapter 1,** the introductory chapter, will define the aim and scope of the text. It will also define the responsibilities of member NATO nations for producing and maintaining the validity of their respective chapters.

• **Chapter 2** will cover artillery terms and definitions currently found in the NATO Glossary, *Allied Administrative Plan 6*. In those instances where there are terms and definitions that have not yet been approved for inclusion in the NATO Glossary, this fact will be shown. This chapter will require regular updating in order to bring in new terms and definitions and to purge those no longer needed.

• **Chapter 3** will be concerned with STANAG 2144, *Call for Fire Procedures*. It will discuss the two systems currently standardized. In system one, control of field artillery fires rests with the fire direction center/command post (the system used by the US). Under this system, all calls for field artillery fires are *requests*. Under system two, control of fires rests with the observer (a system used by the UK). This observer may *order* fire from the field artillery fire units he is authorized to control. This fire discipline is used when an observer or a commander from one nation is calling for fire or has under his command field artillery fire units of another nation.

• **Chapter 4** will address the standard safety measures and procedures for using artillery laser devices as described in STANAG 2931. This agreement insures uniform safe practices with laser devices throughout NATO operations.

• **Chapter 5** will cover STANAG 2867, *Radio-Telephone Procedures for the Conduct of Artillery Fire*, which illustrates standard radio-telephone procedures to be used by operators involved in call-for-fire operations. It will stress the need for liaison people to overcome language barriers and the need to use the phonetic alphabet as published in *Allied Communications Plan 125*.

• **Chapter 6** will be devoted to STANAG 4130, *Interoperability of Automatic Data Processing (ADP) Systems*. When this agreement has been ratified by those NATO nations using ADP systems in fire support operations, it will insure that field artillery ADP systems can "talk to each other."

• **Chapter 7** will cover STANAG 2147, *Target Numbering (Non-Nuclear)*. It will describe a standard way of designating fire support targets within NATO and will discuss the alphanumeric system to be used. This system will be compatible for use in ADP systems involved in fire support planning.

• **Chapter 8** will outline the provisions of STANAG 2031, *Proforma for the Artillery Fire Plan*, which is aimed at establishing standard formats (proforma) for the several elements of an artillery fire plan used in NATO operations.

• **Chapter 9** will be concerned with STANAG 2887, *Tactical Tasks and Responsibilities for the Control of Artillery*, which is *informative* in nature. This STANAG covers the seven standard tactical missions currently in use by NATO artillery (the US uses four). The chapter will explain the seven inherent responsibilities for each tactical mission shown so that each of the 16 NATO nations will be able to understand the meaning of all standard tactical missions in use by NATO artillery.

• **Chapter 10** will cover STANAG 2099, *Fire Support Coordination Measures*, which describes all fire support coordinating measures currently in use throughout NATO. Individual countries will make reservations to those measures they do not use. Like STANAG 2887, this agreement is *informative*, rather than binding.

• **Chapter 11** will cover STANAG 2008, *Bombing/Shelling/Mortaring/Location Reports*, and will explain the use of these forms in recording and transmitting information incident to counterfire and intelligence operations.

• **Chapter 12** will be a compilation of those STANAGs concerned with meteorology, to include:

1) STANAG 4061, *Adoption of a Standard Meteorological (Met) Message*.

2) STANAG 4103, *Format for Requests for Meteorological Messages for Ballistic and Special Purposes*.

3) STANAG 4131, *Adoption of a Standard Character by Character Meteorological Format*.

4) STANAG 4140, *Adoption of a Standard Target Acquisition Meteorological Message*.

These agreements will allow members of the NATO military community to exchange meteorological data when they are participating in joint combat operations.

• **Chapter 13** will be concerned with STANAG 2088, *Battlefield Illumination*. This chapter will deal only with pyrotechnical illumination which may come from Army, Navy, or Air Force sources. It will describe uniform methods for requesting and controlling such illuminants and will also define planning procedures.

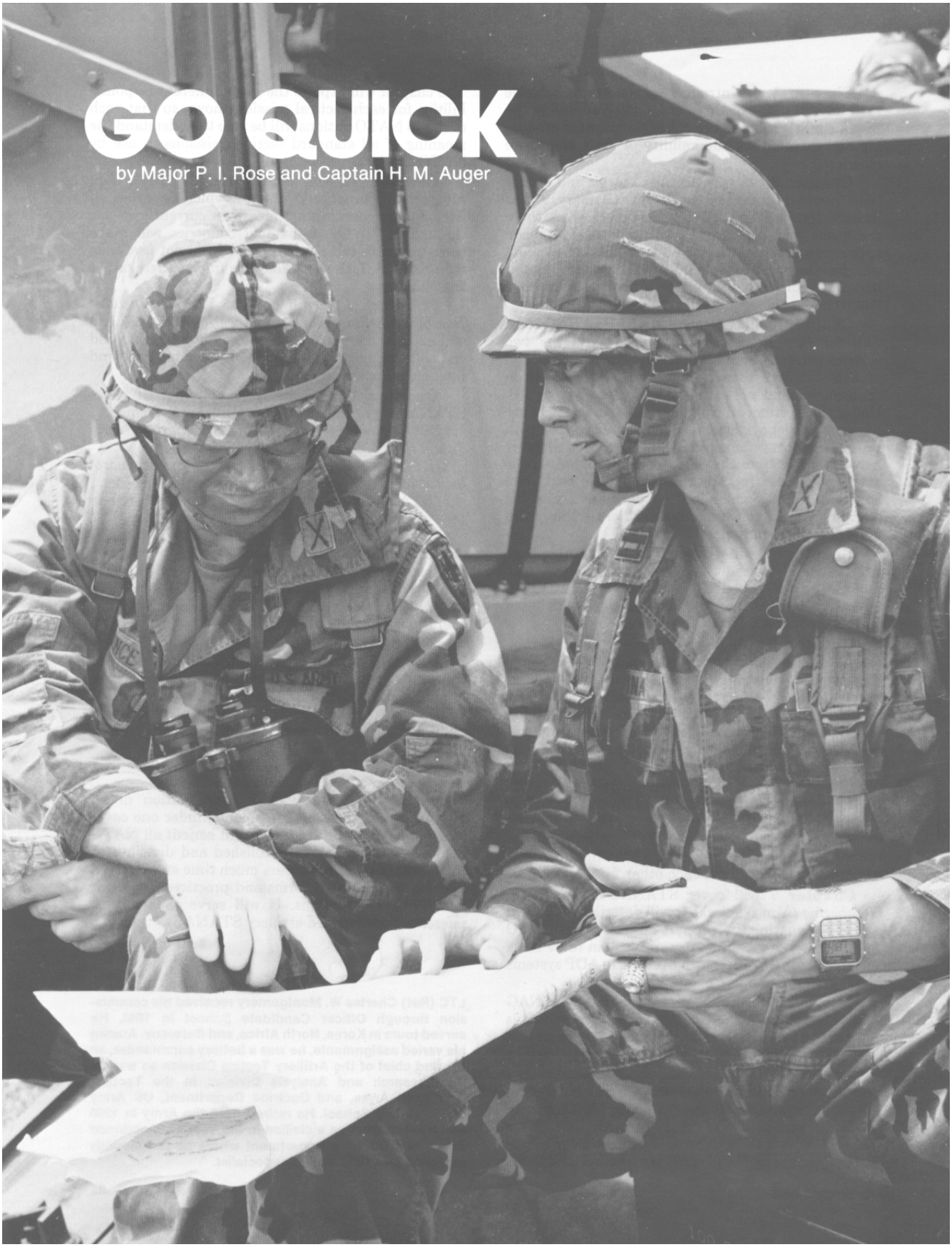
Conclusion

The NATO Army Board's consolidation of all ratified standardization agreements under one cover is a commendable effort which will benefit all NATO field artillerymen. When published and distributed, this workbook will save users much time and effort in locating the standard forms and practices in use for joint NATO operations. It will serve as a central reference for all agreed artillery STANAGs.

LTC (Ret) Charles W. Montgomery received his commission through Officer Candidate School in 1943. He served tours in Korea, North Africa, and Germany. Among his varied assignments, he was a battery commander, an S3, and chief of the Artillery Tactics Division as well as the Research and Analysis Division in the Tactics, Combined Arms, and Doctrine Department, US Army Field Artillery School. He retired from the Army in 1966 and went to work as a civilian in the Tactics, Combined Arms, and Doctrine Department where he is presently assigned as a field artillery specialist.

GO QUICK

by Major P. I. Rose and Captain H. M. Auger



Quick fire planning, as outlined in the new FM 6-20 (January 1983), is a significant advance in fire support planning. It enables a field artillery battalion to provide immediately responsive and effective fires in support of specific maneuver company and battalion operations with only a minimal impact on its support of the rest of the maneuver brigade. In addition, quick fire planning remains the perfect fire support technique for use with the dedicated battery. Field artillerymen need to master this concept, which also accounts for the employment of lasers, if they are to provide timely fire support that can keep pace with the rapid flow of future battles.

Even though the new FM 6-20 gives only a broad brush outline of the quick fire planning concept, it includes enough information to alert the field artilleryman to a significant change in doctrine. Central to the whole concept is the fact that now the battalion fire support officer (FSO) both schedules and *orders* the fire of field artillery units. Thus, it is apparent that the FSO must know which assets (units, weapons, and ammunition) are available for his use and must, of course, have them available to him on a priority basis.

Allied countries such as the United Kingdom, Canada, Australia, and New Zealand already have a mission of "priority call" which makes assets immediately available to observers for planning and ordering fires. The United States, however, does not use this type of mission; and so US field artillerymen must learn to execute quick fire planning within the current doctrinal limits. Though the dedicated battery concept is a familiar use of quick fire planning, its use is limited to a movement to contact; and, since quick firing planning is not so limited, it is necessary to explain its implementation more definitively.

Quick fire planning without laser

Quick fire planning requires formatted verbal and written requests and responses to insure that no information is forgotten or misunderstood in the rough and tumble of the battle. It also requires voice radio communications since digital communications through the digital message device or the variable format message entry device are not structured for quick fire planning. Furthermore, the FSO must know what assets are available to him *before* the planning process begins. Thus, the S3 at the direct support battalion will need to place some or all of his fire units at the immediate disposal of the FSO for a particular time span. If the S3 chooses not to give the firing assets of the whole battalion to the FSO, then he will need to dedicate to the fire planner a radio net for his sole use and will instruct firing units and observers to join this net (normally one of the battalion fire direction nets) as required. From that point on, events should transpire in this sequence:

- *Scenario:* A maneuver battalion on a movement to contact comes up against an enemy position of approximately company strength. The battalion commander decides to take the enemy position by mounting a quick attack with battalion resources.
- *Orders:* The maneuver commander informs his S3 of the brief outline of his intentions with an H-hour of 1200 hours (which gives 45 to 60 minutes to plan the operation).
- *The FSO's warning order:* The battalion FSO makes an assessment of fire support requirements based on his knowledge of how much close air support (CAS) and mortar support are available. He sends a situation report (SITREP)/warning order to the direct support battalion S3 requesting the artillery support.
- *The direct support artillery battalion S3's allocation of assets:* The S3 checks the brigade requirements for artillery support (with the brigade FSO), informs the direct support battalion commander, and allots assets as requirement priorities dictate.
- *The battalion FSO's fire plan recommendations:* The FSO receives the allottment of artillery resources, makes an estimate of supportability, and makes a recommendation to the maneuver battalion commander or staff.
- *The maneuver commander's fire plan:* The commander develops his fire plan so that the FSO can commence any adjustment of fire as soon as possible and pass on pertinent target information to the fire units, including mortar units.
- *Battalion FSO's concurrent action:* The FSO schedules targets, informs fire units of timings, and give tactical information to fire support teams (FISTs).
- *Direct support battalion S3's reply:* The S3 informs the battalion FSO when he is ready to execute the fire plan.
- *Battalion FSO's action:* The FSO informs the maneuver battalion commander when the artillery battalion is ready to execute the fire plan. He reviews the fire plan, to include the use of close air support and mortars, and modifies or adjusts the plan as required.

In order for the battalion S3 to make a balanced decision concerning how many assets to place at the disposal of the FSO, he must have a clear idea of the current battlefield situation. That is why the FSO must send a clear, concise warning order to the S3 early in the planning process. His warning order should contain these elements of information: a brief situation report, the fire plan "nickname" (used as reference), the supported unit (in code), the timing of support requirements, the number of targets (approximate), the required amount of ammunition by type per tube, and the requirements for the adjustment of fire. In turn, the direct support battalion S3 will provide the FSO with a quick reply which will indicate what assets are available to the FSO as he assesses the information supplied by the maneuver commander and creates his fire plan. The S3's answer will contain the fire plan "nickname"; fire units available for adjustment, the time available, and the radio frequency to use; the fire units available for the fire plan, the times they will be available, and the radio frequency to use; and the amount of ammunition by type, by tube, and by fire unit if restricted. ***Note:*** *The S3 can adjust requirements based on his assessment of the situation. Also, the FSO should have sufficient ammunition to allow 25 percent more than is required on the fire plan, which allows for modification and opportunity target*

engagement.) The information the FSO needs from the maneuver commander includes the following: the objectives and other targets; the outline of the attack; the line of departure; the routes, axes, and boundaries; the rate of advance (meters per minute); H-hour; the availability of mortars; the effect required (destroy, neutralize, or suppress); timings for engagement of targets in relation to H-hour; the degree of guarantee of fire (should hit/will hit); the weight of fire (where); the restrictions on adjustment (i.e., use of smoke or illumination); final protective fires required for reorganization; requirements for observers (nonstandard deployment, etc.); any delegation of fire planning authority; the use or coordination of close air support; alternatives to smoke in case smoke is ineffective; and dismounting areas which alter the last safe moment.

While developing the fire plan, the FSO concurrently briefs his fire support teams on pertinent forward observer information, to include an indication of targets (position and dimensions); target numbers; fire units and recommended radio frequency for mortars and guns; the degree of adjustment (point, area, single gun, battery, or battalion); any time limitations; and required future actions (e.g., record as target). He will also give them any tactical information they will need to master the maneuver plan, to include the tactical plan, the fire plan, any modifying authority, restrictions on opportunity engagement (radio frequency to use/mortars or guns), tasks on the objective, and communications to monitor. Once he completes the fire plan, the FSO quickly transmits the target information to the firing units; in addition, he schedules the targets and transmits the order of firing to the fire direction centers (FDCs) in the format shown in figure 1. The transmission would sound something like this:

Warning order:

"SITREP — Quick attack enemy location GR 123456 company strength.
Warning order fire plan 'Altus Dream.'
Supporting 2-5th (code). Timings -15 to +15.
Ten targets H-hour 1200 hours (code).
Require 35 HE, 10 VT, 15 HC, per gun.
Require one battery now for adjustment of fire."

Response:

"Reference fire plan 'Altus Dream.'
Alfa Battery now for 30 minutes for adjustment of fire (frequency 2).
Alfa and Bravo Batteries available -20 to +20, 40 HE, 15 HC (Alfa Battery only), 15 VT."

Note: *There is no requirement for location of target that is being adjusted and no requirement for descriptions to be transmitted. Figure 1 does not show the whole of the fire plan and target information because of space limitations.*

FSO to direct support battalion S3:

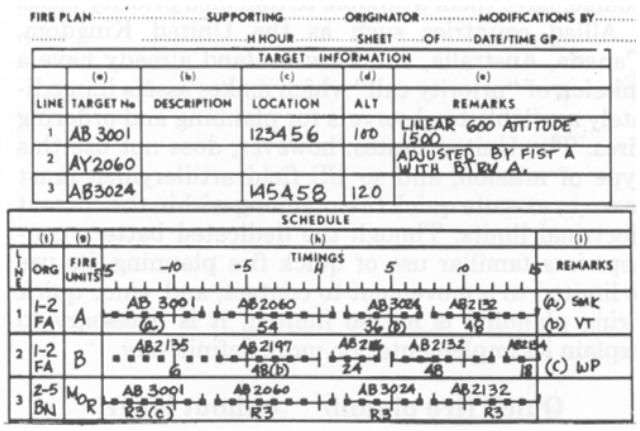
"Target information fire plan 'Altus Dream.'
Line 1: Column (a), target AB3001; column (c), location 123456; column (d), altitude 100; Column E, remarks — linear 600, attitude 1500.
Line 2: Column (a), target AY2060; column (e), adjusted by FIST A with Battery A.
Line 3: Column (a), target AB3024; column (c), location 145458; column (d), altitude 120."

FSO to direct support battalion S3:

"Fire plan 'Altus Dream.'

Schedule: Line 1: Column (f), organization 1-2 FA; column (g), fire unit A; column (h), timings -15 to -8; target AB3001, alfa; -7 to 1, target AB2060, 54 rounds; 2 to 7, target AB3024, 36 rounds, bravo; 8 to 15, target AB2132, 48 rounds.
Line 2: Column (f), organization 1-2 FA; column (g), fire unit B; column (h), timings at -10; target AB2135, six rounds; -7 to H-hour, target AB2197, 48 rounds, bravo; 1 to 4, target AB2186, 24 rounds; 5 to 12, target AB2132, 48 rounds. 13 to 15, target AB 2134, 18 rounds.
Line 3: Column (f), organization 2-5th FA; column (g), 107-mm mortars; column (h), timings -15 to -8,

QUICK FIRE PLAN



Target information contains the necessary information for computation of data by FDC. If targets are to be adjusted, then columns (b), (c), and (d) can be left blank. Column (e) is for nonstandard remarks; i.e., "on call" or "linear 1000 altitude 1500."

Schedule:

Column (f), "organization," is for the organization designation; i.e., "2-5 battalion mortars" or "1-2 FA."
Column (g), "fire unit," is for fire unit designation; i.e., "A Battery."
Column (h), "timings," is filled out as shown below:

Each target is shown by a dot or a line indicating duration and time on target (TOT). The target number is above the line; below the line is either the total number of rounds to be fired or the rate at which they are to be fired (rounds per minute per tube). Subscript notes can be used to indicate nonstandard ammunition. These notes would be written in column (i)

Note: *Mortar information and close air support information would be shown on this form, but only the artillery information will be transmitted to the direct support S3. The fire units fill out the heading and the timing lines when the warning order is sent (prior to receipt of the actual targets).*

Figure 1. Quick fire plan order format.

target AB3001, rate 3, Charlie; -7 to 1, target AB2060, rate 3; 2 to 7, target AB3024, rate 3; 8 to 15, target AB2132, rate 3."

Note: *Alfa is smoke, bravo is VT, and Charlie is WP*.

Once the fire plan is underway, it will undoubtedly require some modification as the flow of battle develops. Since the FSO is right there with the maneuver commander, he can respond quickly and, if the maneuver commander has given him that authority, can alter the schedule of targets to fit the scheme of maneuver.

The quick fire planning principles apply equally to FISTs and FSOs as they plan fire support for company or battalion operations. The sequence of the information flow (table 1) between the field artillery representative and the maneuver commander is essential and should always be controlled by the gunner, not the grunt. Finally, two other points require emphasis here.

Table 1. Sequence of information flow.

Maneuver commander/S3	Fire support coordinator	Direct support battalion S3
1. Brief description of operation.	2. Informs direct support battalion S3 by SITREP and warning order.	3. Informs direct support battalion commander and assesses brigade priorities.
	4. Assesses availability of close air support and mortars.	
5. Positions mortars and forward air controllers (FACs).		6. Sends availability of fire units and ammunition.
	7. Asseses supportability of operation and informs maneuver commander.	
8. Gives information as required by fire support officer.	9. Allocates target numbers and asks adjustment policy.	
	10. Briefs adjusting observers.	
11. Mortars begin adjustment of fire.		12. Tells gun crews to begin adjustment of fire.
13. Gives information as required by fire support officer.		14. Sends time check to fire support officer and fire units.
	15. Gives time to maneuver commander, mortars, and forward air controller.	
	16. Sends target information to mortars, close air support, and artillery.	17. Begins production of target data for fire units.
18. Mortars begin production of target data.	19. Sends schedule of targets to guns and mortars.	20. Prepares ammunition in sufficient quantities.
21. Mortars prepare ammunition in sufficient quantities.	22. Briefs subordinate fire support teams.	23. Reports ready on fire plan.
24. Mortars/close air support report ready on fire plan.	25. Informs maneuver commander ready on fire plan.	
	26. Reviews fire plan and modifies as necessary.	
	27. Joins maneuver commander to control fire plan or goes to designated location.	

- First of all, the maneuver commander will judge the effectiveness of the fire plan by the FSO's ability to orchestrate the system to fire on time, on target. The integration of air and mortar assets into the plan should not affect the FSO's responsiveness. Though the maneuver commander designs the fire plan with the assistance of the FSO and is totally responsible for it, he normally delegates the authority for modification to the FSO; and the FSO must take that initiative when the situation demands it.
- Secondly, time is critical to the fire plan; and so the FSO should try to get the maneuver commander to accept artillery time, since artillery units have more direct access to time checks from the highest level and are more often in step with higher headquarters.

Quick fire planning with lasers

The quick fire planning procedures can be practiced with any of the lasers currently employed by the field

Photos by Sam Orr.

artillery. Although not yet approved as official US Army doctrine, the following recommendations can save time and ammunition and insure surprise.

First, the information which the FSO requires from the maneuver commander remains the same as that indicated earlier for a conventional quick fire plan. In addition, essentially the same requirements exist to pass a warning order to the direct support artillery battalion S3 and to pass important information to subordinate FISTs and their observers. The major difference in planning with lasers is that a laser adjustment point (LAP) is required for adjusting artillery or mortar fires. The LAP may be one of the targets or simply a piece of ground in the vicinity of the combat operation (the latter would more likely insure surprise). In any case, the LAP should be a point that can be easily seen by the laser — for example, a forward slope with no intervening crest. The LAP is adjusted to produce corrections which allow observers to predict target locations which the same laser has determined to be within 3,000 meters of the LAP. These corrections allow for:

- Prevailing meteorological conditions (overcoming errors in the meteorological message).
- Gun/observation post survey errors.
- Gun calibration errors.

If the fire plan covers a large area, it might be necessary to have more than one LAP; in this case, the observer must state which LAP is to be used for each target.

The degree of accuracy of predicted fire is based on corrections obtained from the LAP. Though one does not see rounds on each target in the fire plan, experience with lasers indicates that satisfactory accuracy can be obtained if the same laser is used from the same location to adjust each of the fire units onto the LAP and to obtain corrections for other target locations. Adjustment on the LAP always includes the use of a minimum of three guns, a consideration of the cold-gun effect and the firing of more rounds if necessary, and a target description (e.g., adjusting laser adjustment point A). As the three guns fire (perhaps with a 5- to 10-second interval between each round), the laser spots the bursts; and the observer averages the readings. The resultant average is transmitted to the FDC where it is compared to the initial readings to the LAP (the readings could be averaged at the FDC). The difference in the readings is the required correction to hit the LAP. No additional adjustment of fire is required.

While the FDC is computing corrections, the observer uses the laser on each of the targets in the fire plan and passes this target information to the FDC. The earlier this action occurs, the better. To insure accuracy, a second qualified individual should check the laser readings. The FDC then applies this computed correction to each of the fire plan targets. When more than one LAP is needed, each LAP must be specified for each target.

The FSO or FIST passes the remaining fire plan information, such as timings or ammunition requirements, to the firing units. Indeed, the remainder of the fire plan is completed in the same manner as the conventional quick fire plan.

The use of lasers in quick fire planning requires training and teamwork and has limited application in environments of dust, smoke, or other obscurants. However, laser adjustment with a LAP will create savings in ammunition (usually requiring only three rounds; or six, if the guns are cold) and in time (a well-trained crew can easily adjust a six-target fire plan in only 10 minutes) which will certainly enhance the element of surprise.

Conclusion

There will be times on future battlefields when the success of operations depends almost wholly on the ability of the field artillery to provide extremely rapid and responsive fire support to a specific maneuver company or battalion operation. The trick is to meet this challenge without ruining the continuity of fire support afforded to the rest of the maneuver forces. Quick fire planning is a routine which fills the bill nicely, and all field artillerymen need to learn its requirements and practice them well. When the mission is on the line, go quick in the nick of time.

MAJ P. I. Rose joined the Royal Artillery at the age of 15. He spent two years at the Royal Artillery Junior Leaders Regiment and two more years at the Royal Military Academy, where he received his commission. He has served as a fire direction officer and as a troop commander of both a 105-mm and 175-mm battery. He has served in Germany, Northern Ireland, and the Sultanate of Oman. Currently, he is a British Exchange Officer assigned to the Field Artillery School's Tactics, Combined Arms, and Doctrine Department as an instructor.

CAPT H.M. Auger is a graduate of Queen's University, Kingston, Ontario, Canada, where he received his commission in the Royal Canadian Artillery. His first assignment was with the 2nd Regiment, Royal Canadian Horse Artillery. Since then, he has twice been a troop commander, has been an assistant operations officer, and was an instructor at Canada's Artillery School. He is currently assigned as an exchange officer to the Field Artillery School's Tactics, Combined Arms, and Doctrine Department as an instructor.

Fragments

FROM COMRADES IN ARMS

New air defense system for West Germany

On-site testing is underway on a new air defense system for southern West Germany. Called the German Air Defense Ground Environment (GEADGE), the new system will provide faster and more accurate detection of intruders over West German airspace. The southern portion of West Germany was not included in the extensive NATO Air Defense Ground Environment (NADGE) system which was built by Hughes Aircraft Corporation in the late 1960s and which stretches from Scandanavia to Turkey. GEADGE will connect directly to the NADGE system, including sites in Italy, France, and the northern portion of West Germany.

The new command and control system will not only improve detection capabilities but will also enhance weapon systems' response to threats and will integrate new and existing long-range surveillance radars into a single network. Information from a variety of radars can be correlated on display consoles, thereby forming a complete and accurate display of airborne threats. When a radar detects an intruder, the GEADGE system will automatically track the aircraft and provide three-dimensional location information, velocity, and heading of the aircraft.

If a target is regarded as a threat, computer-derived location information will be forwarded instantly to a West German or NATO fighter, which can be directed from the ground to intercept and counter the threat. The target location information also can be relayed to an antiaircraft missile battery for defensive action.

The GEADGE system provides a reporting network for weather conditions and the status of resources such as air bases, aircraft, and missile batteries.

In addition to the four centralized command centers, GEADGE will consist of manned and unmanned fixed and transportable radar systems, which will insure complete air surveillance.

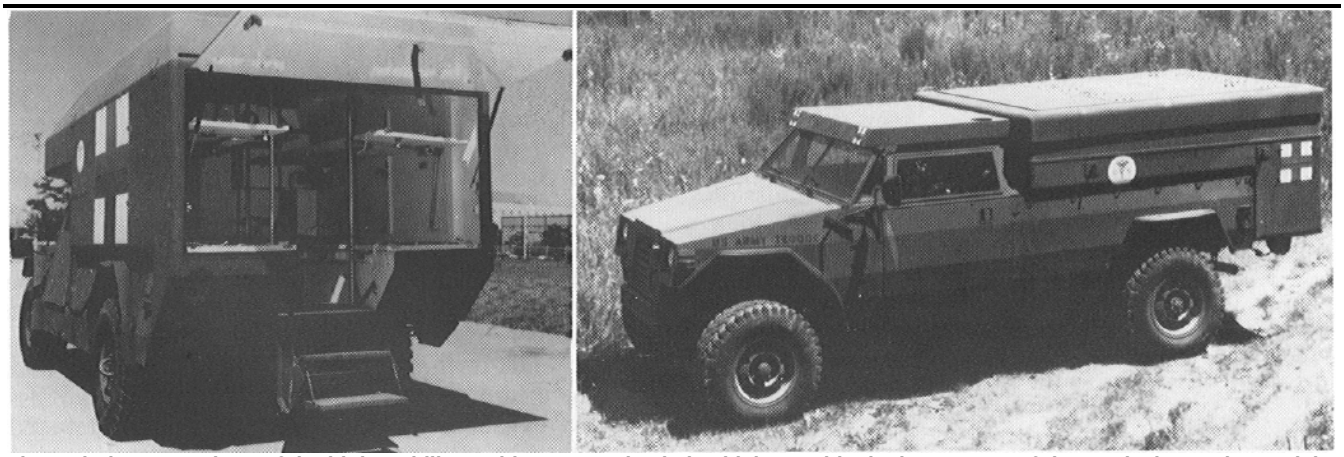
Eventually the GEADGE system will receive radar information directly from the E3A AWACS early warning aircraft patrolling Europe. The AWACS aircraft have long-range surveillance radars capable of monitoring aircraft at distances of more than 200 miles, including those flying at extremely low altitudes.

The GEADGE system is expected to be fully operational in 1984.

Aviation approved as new Army branch

Establishment of a separate Army Aviation Branch has been approved by the Secretary of the Army. The new branch headquarters will be located at the US Army Aviation Center at Fort Rucker, Alabama.

The decision to create a separate branch resulted from a study of Army Aviation requirements by the US Army Training and Doctrine Command. The study indicated that new battle doctrine, which has broadened Army Aviation's role as a combat maneuver element, and current personnel management considerations made formation of a separate aviation branch necessary. The basic nature of Army Aviation and its mission remain unchanged.



The ambulance versions of the high mobility multipurpose wheeled vehicle provide the latest state-of-the-art design and materials, including ballistic fiberglass, and will survive nuclear, biological, and chemical warfare. Interior features include dome lighting with blackout capability, adjustable focusing lighting, electronic control panel, heating and air conditioning capability, oxygen system with cylinder storage racks, space for monitors and aspirators, storage compartments underneath litter benches, and litter loading mechanisms that allow attendants to slide the stretchers in and out quickly and safely. The rear folding step is gas-spring operated. The mini-ambulance version (right) can maneuver with the forward infantry divisions due to its remarkably low profile; with the top elevated for emergency situations, it can carry four litters or eight seated patients. (PSI Specialized Vehicles photos)

LAW 80 antitank weapon

The US Army has received 70 of the LAW 80 antitank weapons as part of a joint Army-Marine Corps evaluation.

LAW 80 is a shoulder-fired weapon equipped with a single preloaded rocket and a built-in spotting rifle. It weighs less than 20 pounds, is approximately five feet long with its telescoping launch tube extended, and can be carried by infantry soldiers in addition to their normal rifles and then discarded after its single firing.

The LAW 80 antitank weapon is produced in the United Kingdom and is marketed in the United States by the Vought Corporation. (Vought Corporation photo)

CUCVs are coming

The Army's tactical truck fleet will take on a new look when the first of the new 4-wheel drive CUCVs (commercial utility cargo vehicles) are fielded in September 1983. The CUCVs will replace the aging M880-series trucks, the Gama Goats, and some M151 1/4-ton trucks and will serve as cargo and personnel transporters, ambulances, mobile communication units, and command vehicles. The new trucks — rated as 3/4- or 1 1/4-ton—are Chevrolet Blazers and pickups, but will have a number of military adaptations, including towing pintles, heavy-duty bumpers, and brush guards. Additionally, they will have 24-volt electrical systems, NATO slave receptacles, blackout lights, and floodlights for the ambulance models.

The vehicles are powered by an 8-cylinder, 6.2-liter diesel engine and a 3-speed automatic transmission. With the deployment of the CUCV and the high-mobility multipurpose wheeled vehicle, the Army will

CUCV Blazer.

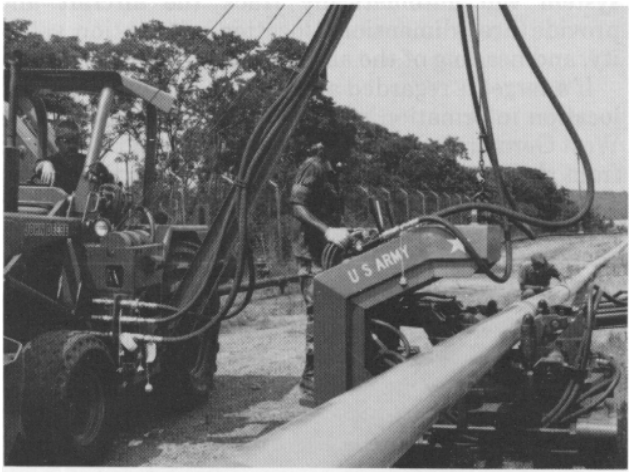
CUCV pickup.

have a totally diesel-powered fleet. Logistical support will be simpler since all Army combat and tactical vehicles will use only one type of fuel, thereby eliminating the need for separate fuel storage tanks and transporters.

A major advantage of the CUCV is the number of parts the civilian and military trucks have in common. In the Blazer model, for instance, of the 3,600 parts listed, only 360 are unique to the military. Thus, most parts can be bought off the shelf rather than be manufactured and sold solely for military use. (Judith Church, US Army Tank-Automotive Command)

Pipeline for fuel delivery

A commercially-developed pipeline system adapted for military use by the US Army Mobility Equipment Research and Development Command is expected to improve bulk fuel delivery in the field.



The aluminum frame hydraulic joining press joins and seals the pipe.

Called POP — for pipeline outfit, petroleum — the system will permit construction of 18 miles of pipeline in one day to carry large bulk quantities of fuel from beach entry to forward corps areas. It consists of a mechanical pipe joint, a hydraulic pipe-joining press carried on a side-boom tractor, and a tapered interference pipe-coupling collar. In operation, the system joins and seals six- or eight-inch pipe in less than one minute.

The military version uses aluminum in place of steel in the structural frame of the hydraulic press to reduce weight and improve transportability. The substitution does not affect system effectiveness.

PV2s Paul Bagnato, Jeff Hilton, and Sam Spencer (left to right) check the MLRS power distribution system to verify technical manual course validation. (Photo by SSG Harry Sarles)

MLRS training

Training is underway at the Missile and Munitions Center and School on the Multiple Launch Rocket System (MLRS). Students are being trained in specialty 27M (MLRS repairer). The program of instruction is designed to teach enlisted personnel the skills and knowledge to perform general support maintenance on MLRS and associated test equipment. Approximately six weeks of the 18-week course is spent learning basic electronics.

Underwater vehicle

Lockheed Missiles & Space Company is planning to build and test six prototype, low-cost underwater vehicles that can be launched from helicopters to destroy enemy naval mines.

The battery-powered, wire-guided vehicle, dubbed the low-cost expendable neutralization system (LENS), will be built under contract to the Naval Air Systems Command. Subcontractor is EDO Wester Corporation which will supply the sonar and terminal guidance systems.

The LENS, which will be five feet long and eight inches in diameter, will be used in conjunction with existing fleet mine-hunter sonar systems and will be capable of neutralizing both moored mines and those laying on the ocean floor.

For Lockheed, LENS is the latest in a series of small, highly accurate, remotely-controlled tactical and research systems. Others include a device to render useless airfield runways and to destroy bunkers; a small unmanned airplane for reconnaissance and target designation; and a 1/12th-scale submarine for dynamic study of submarine control surfaces and systems underwater.

Imagery Interpretation Centers

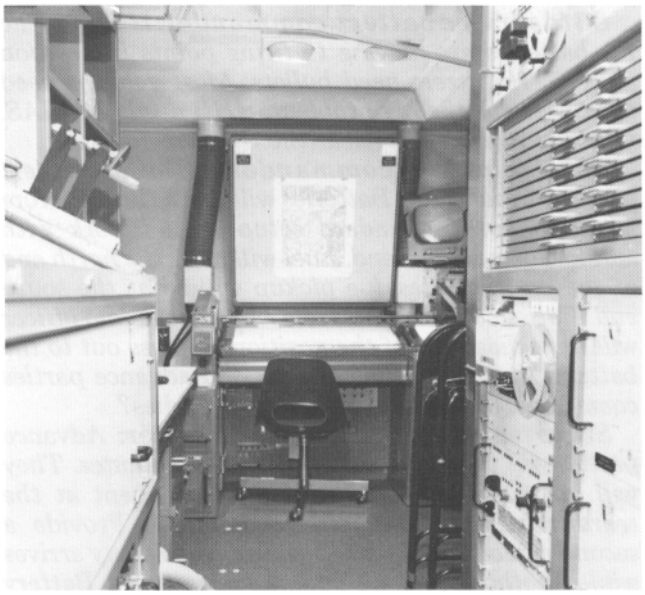
Army image interpretation came into sharp focus recently with the fielding of two mobile army ground imagery interpretation centers (MAGIICs). The Combat Surveillance and Target Acquisition Laboratory, an element of the US Army Electronics Research and Development Command, turned over two operational systems to US Army, Europe.

One system was installed at Zweibruecken Air Force Base in Germany, where it will be operated by the 581st Military Intelligence Detachment. The second was installed at the Royal Air Force-Alconbury in the United Kingdom, where it will be operated by the 582d Military Intelligence Detachment.

MAGIIC is a two-shelter, computer-assisted intelligence dissemination facility. Its minicomputers, large intelligence data base, and automated aerial photographic exploitation stations provide state-of-the-art tools for rapid exploitation of aerial photography. Intelligence reports can be sent over the automatic digital network (AUTODIN), tactical teletype, and digital data link communication subsystems organic to each MAGIIC shelter.

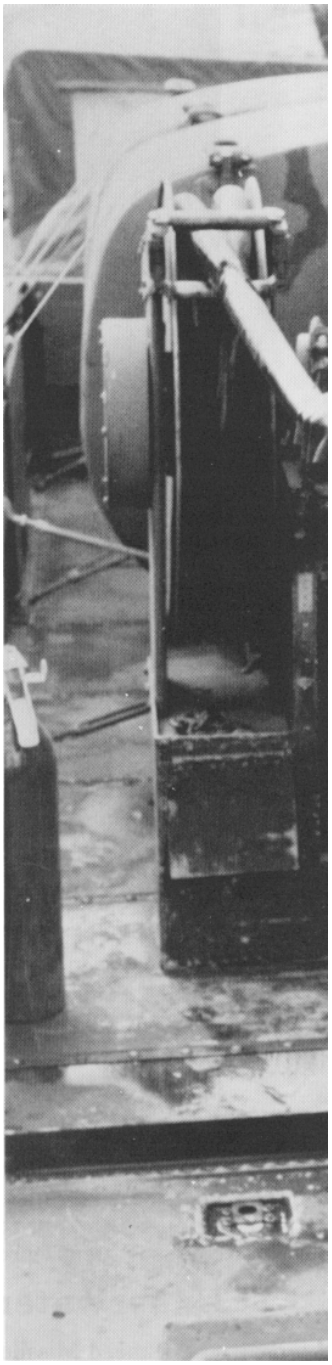
MAGIIC is the first tactical system certified by the Defense Communications Agency for direct tie-in with AUTODIN.

The fielding of the first two systems does not complete the work of the MAGIIC team. Four more systems will be fielded next year in Korea and the United States.



Interior view of the shelter showing the photo interpretation console and supporting computer and communication equipment.

Photo by Sam Orr; all other photos by 1LT Casey Brady.



Rearming and Refueling

by Captain John M. House

S3 to service battery commander: *HHB and the FA batteries are moving to firing points in position area 67. Howitzers need bullets. Most vehicles need fuel. Diesel is the big problem. HHB needs MOGAS. Can you rearm/refuel near the Synchro Range?*

Service battery commander to S3: *Check. We'll pass out rations, too. Batteries will move through from south to north. Standard setup should work with ammo Goers end-to-end. Fuel will be at the north end of the position. Residue pickup will be at the south end. Rations will be off to one side. The ammo officer will have diagrams of the positions to pass out to the battery XOs when they arrive. Will advance parties come through first or with the main bodies?*

S3 to service battery commander: *Advance parties will precede main bodies by 15 minutes. They will not have any howitzers; so time spent at the rearm/refuel point should be minimal. Provide a second assembly area in case an advance party arrives while another battery's main body is there. Battery main bodies will arrive at 45-minute intervals beginning at 0900 in this order: B, HHB, C, and A.*

The actors may change, but the dialogue in this scene is acted out continuously at the Grafenwoehr Training Area in West Germany. Until recently, there were few hard and fast doctrinal rules for artillery logistics. The new FM 6-20-1 will provide guidance and should help fill this void, but many units have already devised their own techniques for rearming and refueling the batteries of a field artillery battalion. The solution outlined here reflects both the tactical and administrative considerations inherent in Grafenwoehr and Maneuver Rights Area training in West Germany.

A major concern of an S3 and a service battery commander is the selection of a location for the rearming and refueling point. The area near the Synchro Range in Grafenwoehr is typical of the type of terrain where rearming and refueling are most easily managed (figure 1). There is sufficient space to position all vehicles and not impede the traffic flow from south to north or north to south. A good road network around the area also facilitates movement — traffic can enter and depart the position from the adjacent main tank trail. Trees scattered throughout the area permit good concealment. Wooded areas at both ends of the position are effective assembly areas. Ammunition residue turn-in occurs at a separate location at the position entrance to avoid confusion with the ammunition issue. Positioning the refuel point at the end of the area allows wheeled vehicles to refuel while howitzers and ammunition carriers are drawing ammunition — a technique which gets them out of the area quickly and decreases congestion. The ration breakdown point is a ration truck located to one side of the traffic flow near the exit point.

Rapid movement throughout the rearming and refueling point is a must since a battery is extremely vulnerable to ground or air attack while grouped around the ammunition and fuel vehicles. If sufficient personnel are available, the service battery commander can man observation posts to decrease the vulnerability to ground attack. Another reason why a long stay at a rearming and refueling point is counterproductive is that it keeps the firing battery away from its fire support mission. Batteries can, of course, cycle through a consolidated rearming and refueling point at intervals; but then one encounters the problem of leaving the logistics personnel in a position so long that they are detected. One way of avoiding a long stay for both the batteries and the logistics personnel is to set up a succession of rearming and refueling points — a different location for each battery. Administrative changeover times for position area control at Grafenwoehr will nevertheless sometimes force an entire battalion to displace at once, and in these times a consolidated rearming and refueling point may be the most efficient technique.

A few more points about a rearming and refueling point require emphasis to complete the picture of the operation. Each howitzer leads its section M548s through ammunition issue so that rounds can be quickly loaded. Consolidating ammunition residue on one or all M548s certainly makes residue turn-in easier but may not always be convenient for howitzer sections. Ground guides are critical to the movement plan because they insure entry at the correct point and adherence to the plan's directions and sequence. Darkness and ground fog (a real hazard in Germany) increase the number of ground guides required, and the guides should have flashlights with red lenses for night operations. Though vegetation is useful for concealment in day operations, a position with no vegetation will be feasible under the cover of darkness or fog. Since snow and ice are a particular trafficability problem in cold climates, the rearming and refueling operations could account for a greater expenditure of time as personnel cope with difficult steering and poor footing — a Goer ammunition vehicle can easily become the world's largest sled on a frozen tank trail somewhere in West Germany.

Sometimes the situation will not permit the rearming and refueling elements of the service battery to displace to a separate location, and hence it may be necessary to use the service battery position for the operation. Flexibility is the key here, for the physical characteristics of the service battery position area may not be optimal for quick and efficient processing of the

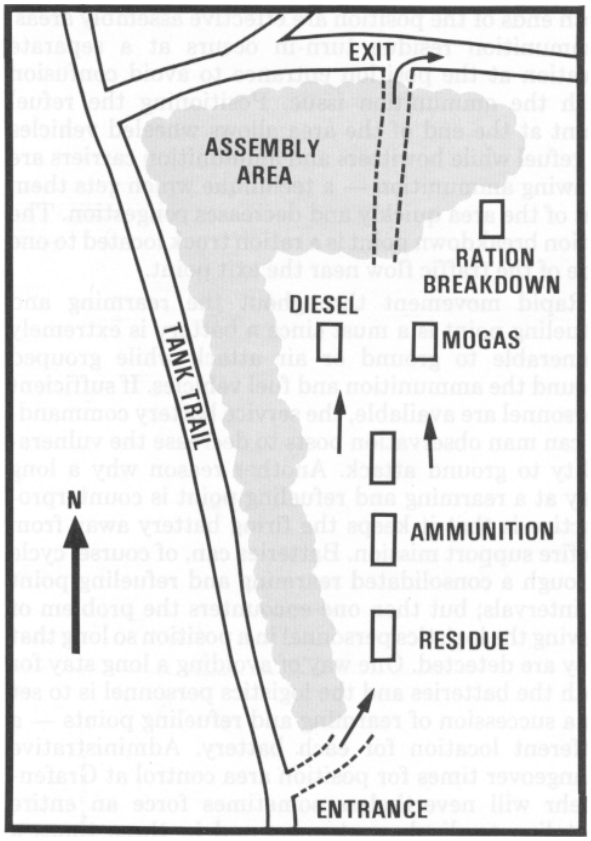


Figure 1. Synchro Range rearming and refueling point.

firing batteries. Figure 2 shows one use of Hardstands 3 and 8 at the Grafenwoehr Training Area when a service battery position becomes an impromptu rearming and refueling point. The area is exceptionally large, and a tight perimeter with interlocking fields of fire is difficult to achieve with the personnel on hand. The road network forces ammunition, fuel, and ration resupply to be conducted in two separate positions. Trees along the exit route force many vehicles to remain parked on the road because insufficient room is available to position them elsewhere. The large open area in the center of Hardstand 8 severely hampers concealment, although it does facilitate the movement of traffic. The battalion S1/personnel administration center (PAC) is located with service battery; and, although communications are not the best since the whole area is in a sunken bowl, the PAC radio is invaluable for establishing a central administrative/logistics information collection and coordinating point for the battalion. (The lack of a radio on the modified table of organization and equipment for the S4 is a continuing problem. The radios authorized a service battery are all in vehicles that periodically must leave the area to conduct maintenance, ammunition resupply, or command coordination. Positioning the PAC with service battery serves the S4 but hinders the S1 in using his vehicle purely to coordinate his own administrative actions. The only real solution would be an authorization of a radio for the S4.)

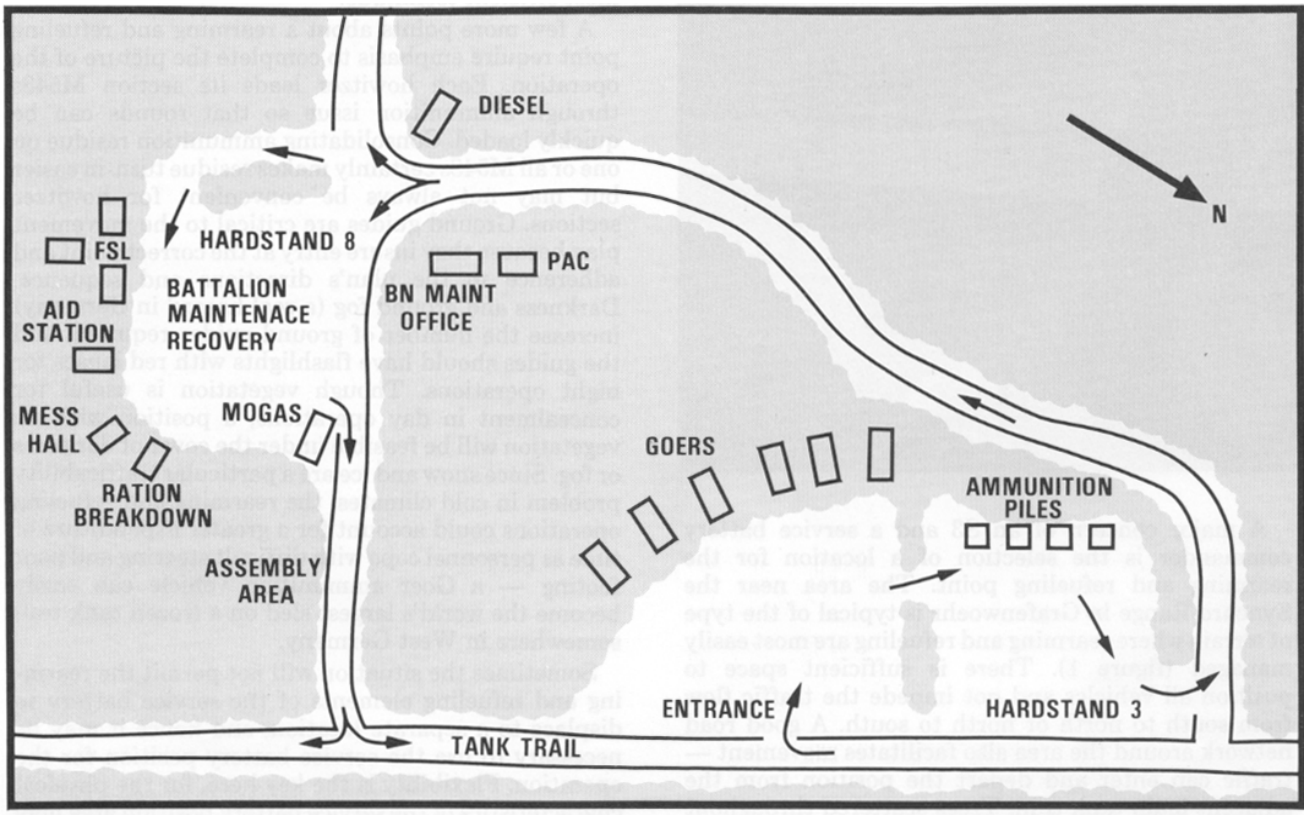


Figure 2. Service battery position as a rearming and refueling point.

There will be times when rearming and refueling will have to be pushed forward to the positions of the firing batteries and headquarters and headquarters battery. Ammunition, fuel, and rations can be delivered to the battery positions; but from the logistics standpoint this technique is not the most efficient use of time and personnel. Nevertheless, there will always be hasty firing battery moves to avoid enemy contact, as was so often the case during REFORGER '82 when the opposing force maneuver elements made rapid advances. So, the service battery commander must deal with the problem of coordinating the dispatch of resupply elements to battery positions without radios.

The ammunition officer, for example, has a radio and must use it in runs between service battery, the battalion tactical operations center, ammunition supply points, and ammunition transfer points; consequently, no radio is available to accompany the resupply convoy. This lack of communications can be disastrous if the tactical situation deteriorates while the convoy is moving. A fluid battlefield characterized by rapidly moving armor formations can put many gray hairs on a service battery commander's head.

Rearming and refueling the batteries of an artillery battalion are difficult tasks requiring much coordination, and there really is no single way to accomplish them. The imagination and flexibility of the service battery commander and the resources available to him determine the technique selected. What is important is that such techniques receive exposure and are discussed by field artillerymen who do not want to be hindered by their logistical tail. Service battery tactical operations have too long been an unknown arena, and it is high time to correct that situation.

A frequent contributor to the *Journal*, CPT John M. House, FA, received his commission through the ROTC at Auburn University. A graduate of the Field Artillery and Infantry Officer Advanced Courses, he also has a Master of Science degree in business. Currently the commander of F Battery (Target Acquisition), 29th Field Artillery, he was also the commander of Service Battery, 6th Battalion, 14th Field Artillery.

Redleg Newsletter

ITEMS OF GENERAL INTEREST

Reenlistment policy revised

A Department of the Army message has drastically cut the options of persons desiring to reenlist; for example, a first-term soldier can reenlist for his or her present CONUS duty station, but the CONUS-to-CONUS reenlistment option is being phased out.

Congressional budget cuts have limited permanent change of stations funds; therefore, it is no longer economically feasible for the Army to continue the CONUS-to-CONUS reenlistment policy. Since a high number of first-term soldiers have already reenlisted, the Army feels that the service's readiness will not be affected.

The suspension of this option will not affect soldiers who already have a valid contract for Option 4-17; this contract will be honored.

Is your ORB up-to-date?

In a sense, the officer record brief (ORB) is the Army officer's résumé. Commanders and supervisors use the ORB to determine an officer's qualifications for a duty position. Department of the Army Selection Boards use the ORB to establish initial impressions of an officer's potential for promotion, schooling, and command. Assignment officers use the ORB as an aid in finding officers qualified to fill positions and in making other important professional development decisions.

It is the officer's responsibility to keep his "résumé" up-to-date. Nevertheless, many officers seem to avoid updating their ORBs until a problem arises. DA Pamphlet 600-8, Procedure 5-1, is the ORB correction bible. Copies of this pamphlet are available in most units' personnel administration centers (PACs) and at the local military personnel offices (MILPOs). It only takes about 10 minutes to read it.

Headquarters, Department of the Army (HQDA), sends a copy of the officer's most recent ORB to his or her MILPO three times a year. The ORB received in the officer's birth month is the audit ORB and must be audited. The officer's signature on the audit ORB attests that the data on the ORB is correct or that changes have been indicated which must be submitted by the local MILPO. The other two ORBs will come at four-month intervals following the audit ORB and should be used to check whether the indicated changes were made. Changes may be made through the MILPO anytime during the year.

What type of data is printed on the ORB? When an officer comes on active duty, a record of his or her entry on active duty is made on an automated data base, called the Officer Master File (OMF), which is located at the US Army Military Personnel Center (MILPERCEN) in Alexandria, Virginia. The data which is entered on each officer at active duty time is sketchy until the officer arrives at his or her first duty station. Here, the local MILPO sends a copy of DA Forms 2 and 2-1 to MILPERCEN where the record is completed to the extent possible. Once data is entered on the data base, it is maintained until some action either at HQDA or through a Standard Installation/Division Personnel System (SIDPERS) causes the data to change. The data printed on the ORB is a copy of the data stored in the OMF automated record.

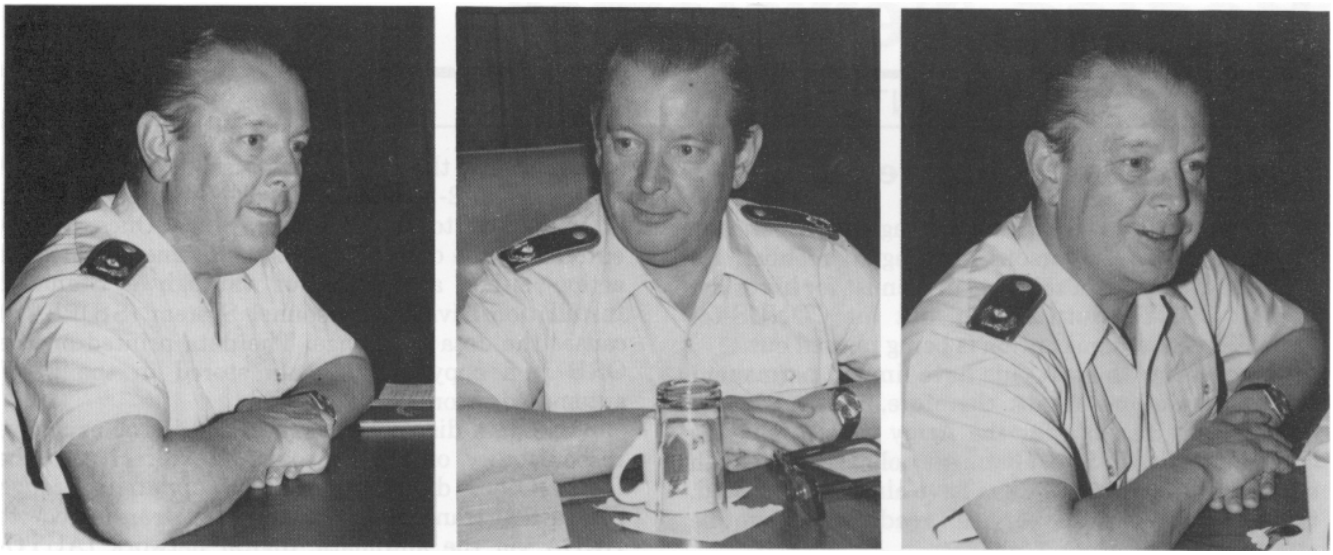
Some data displayed on the ORB is the exclusive responsibility of HQDA to update directly to the OMF. Other data can only be updated through SIDPERS transactions which are transferred to HQDA via the automatic digital network (AUTODIN). If one of the data elements on the ORB listed in table 5-1-1, DA Pam 600-8, needs updating by HQDA, the officer has his or her MILPO send a letter to the appropriate agency as listed in the "Correction Procedure" column of the table. The officer must provide the MILPO with adequate data to validate the requested change. Usually, sending the request for change through the MILPO to HQDA, rather than directly to HQDA, is the best way. If there is a change in the procedure, the MILPO is more likely to know about it. If there is a problem with the update procedure, the MILPO chief can bring it to the attention of HQDA to get the problem fixed.

Each item on the ORB is important, but those items which are most often noted as not being accurate by selection boards are military education level, civilian education level, height/weight, and assignment history. Specific details on how to make ORB changes are outlined in table 5-1-1, DA Pam 600-8. (LTC John C. Eberle, MILPERCEN)

PCS options and TDY

In a recent news release, the US Army Military Personnel Center clarified options available to servicemembers when a permanent change of station (PCS) includes temporary duty (TDY) en route to a new duty station.

- The departing servicemember may elect to complete the temporary duty and return to his or her duty station and then move family members.
- A soldier may also choose to stop at the new duty station to settle family affairs before continuing to the TDY station.
- A servicemember may decide to return to the current duty station upon TDY completion and move the family living on the local economy to the new duty station before the permanent change of station begins.
- In other instances, the servicemember may elect to clear the current duty station and move the family to the temporary duty station at his or her own expense or to a designated location at Government expense.



Photos by Sam Orr.

Interview mit dem General

During his recent visit to the US Army Field Artillery School, Brigadier General Franz-Josef Wiesner of the Bundeswehr granted an interview with the *Field Artillery Journal*. Currently the Director of Combat Support Troops, General Wiesner entered the Arbeitsdienst in 1943 and later that year joined the Wehrmacht. In his long and varied career, he has commanded an armored artillery battalion, a mechanized infantry brigade, and a corps artillery.

Journal: Could you tell us about your job as the Director of Combat Support Troops?

BG Wiesner: *I am the General of Combat Support Troops. This is apparently a very strange title since people believe that I am responsible for logistics, maintenance, and ordnance. But this is not the case. I am responsible for the development, for the armament, for the organization, and for the training of five army branches; and these are the artillery, the combat engineers, the air defensive, the NBC, and the topographic troops. I am the higher headquarters for the pertinent army schools for those branches. My division is a part of the General Army Office which is located at Köln, Germany, and which since 1 April is headed by a new commanding general, Lieutenant General Dr. Werner Schaefer. In addition to those functions, my office is responsible for the training of all those branches that is done abroad. So, for instance, we are firing the Lance and the Roland on Crete. We are firing the Gepard on Sardinia. We go for Stinger training to White Sands. We do the troop testing for the new drone CL-289 at White Sands, and we participated in your OT III testing of the MLRS at the very same place.*

Journal: Who is the chief fire support coordinator in the German Army's field artillery?

BG Wiesner: *Planning for, and employment of, the artillery is conducted, as a matter of principle, on the major unit commander level (e.g., division and brigade artillery commander). Below this level, an artillery battery commander or fire support officer is available to each battalion of the maneuver forces, as well as one or several observers who act as artillery advisors in the field of direct support with the company commanders.*

Journal: What does mutual support mean to you? Should the US and German armies be able to interchange their artillery? How would this happen?

BG Wiesner: *Mutual support of both armies by artillery and an exchange of artillery units are imperative and are — with a view to the joint defense*

mission — practiced permanently and with great success during exercises (especially exercises of the general defense plan), artillery live firing practices in major training areas, map exercises, and other training activities. Partnerships between US and German artillery units exist everywhere, are carefully cultivated, and are of great value for the improvement of cooperation.

Depending on mission and situation, artillery units can be either subordinated or directed to support maneuver units. In any case, an exchange of liaison officers with a knowledge of the respective other language and of the pertinent NATO STANAGs is indispensable.

Journal: Is there a need for a long-range deep attack capability?

BG Wiesner: *In view of the expected superiority of the Warsaw Pact land forces (as much as 6 to 1 over NATO forces), a requirement exists — above all for the artillery — to attack second echelon forces already in the depth of the battlefield. The artillery must be in a position to impede the movements of approaching enemy armor decisively and to inflict heavy losses on them. Only in this way will it be possible to achieve a more favorable balance of forces before the enemy arrives at the FEBA and thus to relieve friendly maneuver forces considerably.*

Journal: Are the days of cannon artillery numbered? Should cannon artillery have ranges greater than 30 kilometers?

BG Wiesner: *Both cannon and missile weapons systems have their advantages and disadvantages — and both will, also in the long run, be required to augment each other in their fire support role. Altogether, the missile seems to be more capable of future development — especially with regard to increases in range. Though an increase in range of the tube artillery is desirable — particularly by means of new, extended range types of ammunition — and conceivable, realization will, first of all, be dependent on, and must be judged by, the required technological efforts and the cost-effectiveness.*

Journal: Can the Free World armies continue to travel the route of smart munitions? Is there a place for the dumb munitions?

BG Wiesner: *With regard to the necessity just mentioned of primarily engaging moving and armored targets (main target is the battle tank) in the depth of the battlefield, a continued development of terminally guided ammunition is indispensable. Cost-effectiveness is, of course, a decisive factor. It is, however, to be expected that the high hit accuracy and effectiveness of terminally guided ammunition will considerably reduce ammunition expenditure per target and may even prove more effective.*

For the engagement of all other semi-hard and soft targets (70 percent), conventional ammunition — and also improved conventional munitions are considered in this context — will have to be available in sufficient quantities.

Journal: Military Operations in Urbanized Terrain (MOUT) continues to receive interest in the US Army. What do you see as the role of field artillery in attacking or defending in built-up areas — should field artillery merely isolate the enemy for maneuver forces or should it also knock down buildings?

BG Wiesner: *When operating on urbanized terrain it is — within the framework of direct support — the artillery's uppermost task to smash or at least suppress enemy forces. Separation of enemy forces from friendly forces and the destruction of terrain and infrastructure are, as a rule, conceivable as a possible and also desirable side effect, but not a priority. It is important, however, to take into account the complicated task of fire support on urbanized terrain through especially closely dedicating forward observers to maneuver units and to compensate this difficulty with a higher density of them.*

Journal: How much time does the German Army's field artillery spend in night training?

BG Wiesner: *High importance is attributed to night training. The proportion of night training varies according to type of training and MOS. The requirement during unit training is 30 percent. During exercises and on MTAs, however, a higher night training proportion is expected and actually conducted.*

Journal: Do you think field artillery should suppress enemy air defenses while your aircraft are flying missions?

BG Wiesner: *In principle, suppression of enemy air defense (SEAD) is also part of the artillery's tasks. During close air support (CAS) missions, however, close coordination is required between employment of the artillery and the Air Force, both at the level of major units — between division artillery commanders and the air liaison officer — or at the battalion/company level between the artillery battery commanders/forward observers and the forward air controller. Suppression of enemy air defense during CAS missions has to regard very carefully the restrictions imposed by airspace management.*

Journal: How has the role of the field artillery changed since your first experiences in the Wehrmacht of 1943?

BG Wiesner: *In principle, no change has taken place. The significance of the artillery as the main partner of the maneuver forces in combined arms operations has, however, increased considerably since then. The traditional primary effects of the artillery on the battlefield through reconnaissance and fire have been further developed by means of new weapon systems (armored, SP artillery, rocket artillery) and their increased range, rate of fire, and mobility and also by the developments in the field of munitions (antitank mines, effectiveness against hard targets, and* ***nuclear*** *capabilities) and new reconnaissance means (radar, drones, target acquisition remotely piloted vehicles.)*

Journal: Thank you, Sir.

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Front Cover photo: Half-section by Jim Hysaw; horse soldier by Sam Orr. Back Cover by Sam Orr.

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