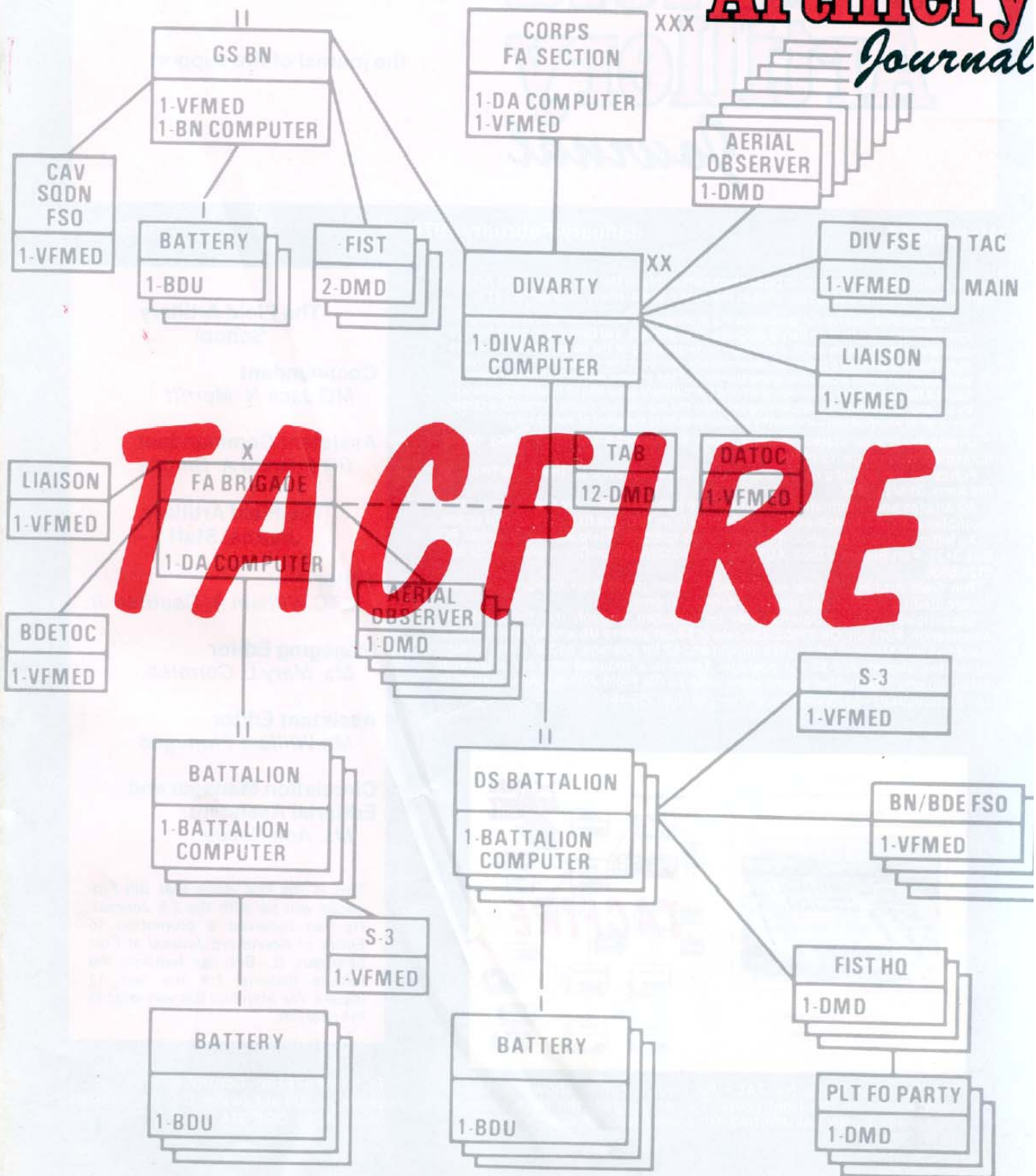


January-February 1979

# Field Artillery Journal





# Field Artillery Journal

the journal of fire support

Volume 47

January-February 1979

Number 1

The *Field Artillery Journal* is published bimonthly at the US Army Field Artillery School for the same purpose 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 powers and limitations as to the field artillery's progress, development, and best use in campaign; to cultivate, with the other arms, a common understanding of the powers 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."

Unless otherwise stated, material does not represent official policy or endorsement by any agency of the US Army.

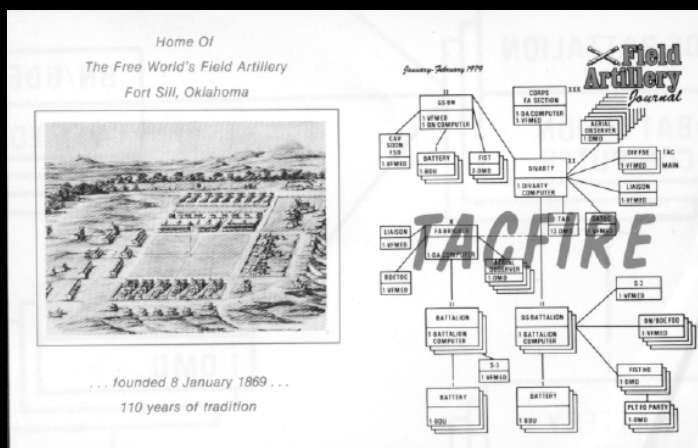
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The basis of issue for TACFIRE equipment is shown in the background on the front cover. The drawing on the back cover was made by an unidentified 4th Cavalryman in approximately 1877.

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This is the last issue that Bill Finnegan will be with the *FA Journal*. He has received a promotion to Editor of *Recruiting Journal* at Fort Sheridan, IL. Bill has handled the feature material for the last 11 issues. We wish him the very best in his new job.

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# *On The Move. . .*

by MG Jack N. Merritt

In September and October I spent several weeks visiting our Allies and our European forces. It was the first time in several years a Commandant of the United States Field Artillery School was able to visit the French, British, and German Artillery Centers as well as the artillery units of the US Army in Europe. The dynamic nature of the modern battle and our perception that the role of the Field Artillery is changing and growing caused me to be interested in what directions our NATO Allies are moving. I gained many insights during my visits to Woolwich and Larkhill in Britain, Bourges and Draguignan in France, and Geilenkirchen and Idar-Oberstein in Germany, and I want to relate some of them to you.

I was encouraged to find that there is a great deal of commonality in the thinking of NATO artillery centers. Most of the conclusions we have reached in the US Army are well supported by the French, British, and German armies. And, there are many similarities in both doctrine and equipment being developed by the nations I visited.

In doctrine, there seems to be a feeling that we are in a period of renaissance for the field artillery and fire support with a fresh understanding of the many requirements for the field artillery and the growing importance of a modern automated field artillery on the battlefield. Our Allies, as do we, place increasing emphasis on attacking threat artillery. They appreciate the potential effect of the guns and rockets on the Warsaw Pact and how the counterfire effort interacts with the central battle—that place where our forces collide.

This emphasis on the importance of counterfire reinforces NATO interest in our General Support Rocket System (GSRS). The GSRS will be extremely effective against counterfire targets, and a GSRS capability common in the NATO forces will go far toward neutralizing the Warsaw Pact artillery capability. The combined interest in the GSRS has been the genesis of a



rationalization, standardization, and interoperability effort which is fast becoming the model for US and NATO development.

There are also common directions in many other developmental areas, including fire direction computers, new 155-mm howitzers, meteorological equipment, and new organizations. Each country is pressing to modernize its artillery forces and there is impressive dedication to this effort.

The British BATES, the French ATILA, and the German IFAB and Adler fire direction computers all open up the long-standing tactical and technical fire control bottlenecks inherent in a manual indirect fire

system. Like our TACFIRE/BCS, these computer systems have been carefully designed to match command and control capabilities with the rapid pace of the next battle. Of course the architecture of each of these systems is designed to fit national concepts, so we are faced with a real challenge to develop the interface necessary to exploit the capabilities of all of our systems.

The new, trilaterally developed FH-70 and SP-70 and the French GCT 155-mm howitzers are all developments which reflect common concerns with improving the range, rate of fire, and capability of the guns.

Each of the nations I visited has also developed a new meteorological system. While these systems do not have all the advanced technology characteristic of the US FAMAS, they *are* in the field. As you know, FAMAS is several years from fielding under the most optimistic schedule.

Given the progress being made, it makes sense for us to keep in very close touch with our Allies—to be on the alert for their innovations of use to us in our developments.

In sum, my visits to all three countries' artillery centers demonstrated we have all reached many common conclusions and are remarkably similar in our views of the role of the artillery on the next battlefield. It's encouraging to know our own directions have been ratified by the artillerymen of the FRG, UK, and France and that we have a certain unity of effort with them in our drive to enhance the effectiveness of the field artillery.

The second purpose of my travels was to visit with the US Field Artillerymen in Germany, an opportunity I had not enjoyed in several years. I can report that the spirit of Saint Barbara is alive and well in Europe today.

In my visits to the V and VII Corps and to the 56th Brigade, I saw dedicated artillerymen of all ranks and units at Pershing QRA sites where our missileers have the only operational mission in the Army, at the guns, and amongst surveyors, Lance missilemen, and meteorologists. I saw professionals intent on reaching the highest standards in spite of the problems they face in the personnel, training, and equipment areas.

As a result of my visits and of the Senior Commanders' Conference held 14 through 16 November, we at Fort Sill are focusing on the real problems of the Field Artillery in Europe and we are working hard to solve them.


With respect to our current equipment, I again emphasize our need for new meteorological equipment. Our corps and division fronts are simply too wide for our current met capability to service. That required coverage and the need to replace equipment two generations old tell me we must intensify our efforts to field a modern, capable, reliable met system, whether by continued development of our FAMAS or by examining a possible off-shore buy of existing gear.

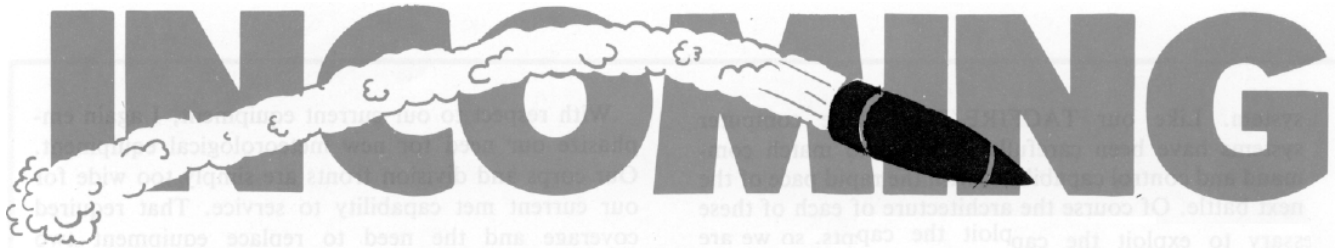
The same extended fronts which affect our met coverage also strain our communications and therefore our command and control capabilities. In several areas, FA groups/brigades have been given fire support responsibility for part of a division zone. Those units report that their organizations may be too thin in both men and communications equipment to take on that mission with complete success.

The resultant charge to the Field Artillery School is to look closely at the employment options an FA Brigade should be capable of executing and then to design an organization with the right numbers of men and materiel to perform those missions.

At the corps level, there is concern over the role of the corps artillery officer and over the capability of the Field Artillery Section to assist him in carrying out his responsibilities. The definition of the role of the artillery at corps is also a main topic for study at Fort Sill, not only as a result of Europe's concerns but also in relation to the work in progress on the artillery's functions as a part of Training and Doctrine Command's new requirements analyses.

Finally, it was evident from my discussions with UK, FRG, French, and US commanders that there is not yet a doctrinal consensus on how much movement by artillery units is the right amount. Given limited real estate for position areas and a heavy demand for fires, unconstrained gun-and-run tactics to improve survivability may be questionable. In this area, the British and Germans lean much more toward limiting movement than we do; however, in my view, we have not yet thoroughly analyzed our gun-and-run tactics to determine where the point of balance is between survivability and effectiveness. We must do so soon.

I have returned from Europe encouraged that our NATO Allies are attacking the same artillery problems we are, proud of the US Artillery units and Artillerymen I saw, and most of all determined to concentrate on our shared problem areas. 



## letters to the editor

**"There are improvements to be made in nearly everything we do, if we will but exploit all the resources available to us, including soliciting the ideas of all soldiers, from private to senior general." – GEN Bernard W. Rogers, 17 Aug 76**

### Satire or poor taste

If it was satire, it was in poor taste; if it wasn't, the editorial staff should receive sharp raps on the knuckles for the *FA Journal* issue of November-December 1978. You did no service to women in the Army or the Field Artillery by publishing those photographs of howitzer crews entitled "Women in the Artillery" and under other titles elsewhere in the issue. I won't detail the many, many training and leadership deficiencies obvious in those photographs if you will spare me the litany on limited testing. There is simply no such thing as valid limited testing if the purpose is to determine the capability of women to endure the hard and demanding life of the FA cannoneer in combat. Those photographs are terribly misleading--not to those of us who recognize what they lack--but to women in the Army and many others, both male and female, in influential and decision-making positions who do not. As a cannon artilleryman of long-standing, I know that we can use women in the Field Artillery. I suggest, however, we can better insure they are in positions that contribute to the 24-hour-day, week-after-week, and month-after-month mission of the cannon artillery in combat by avoiding the gimmicks, popularity contests, and shooting for the sake of shooting. Make it realistic--the way it was and the way it will be!

George W. Putnam, Jr.  
Major General, USA  
Washington, DC

*The photos were those provided by the testing activity. The only motive for reporting the Aberdeen tests of women was that the tests were an activity which, though unofficial, superficial,*

*and inconclusive, could have a profound impact on our branch.*

*Hopefully, comments such as yours from experts in Field Artillery will help insure more thorough evaluations before women are placed in MOSs 13B, E, and F.--Ed.*

### FA females?

My observations of the biased writing regarding the female in the Army in the November-December 1978 *Journal* has prompted me to respond, in spite of the fear of retaliation by every female in the Artillery.

CPT Rosanne Robison's and MAJ Winn McDougal's articles do not give a true and complete summation of the physiological differences of the female. If the female is to take part in sustained military operations which include long hours of hard manual labor, positioning and repositioning the howitzer, offloading and loading ammunition, participating in fire fights to maintain the security of the battery position, digging emplacements and foxholes, and long hours of no rest, she is going to find it much more difficult than the male.

Of particular interest was the comment on page 15 of Major McDougal's article "Women can be conditioned to double their weight lifting capacity in a few weeks." This is not true based on the present research available.

It is important that we understand that the difference of physical comparison is *maximum* work performance and, in some circumstances (submaximal), the female may outperform the male when size is not a factor. With all things considered in maximum work performance, the male will outperform the female.

Commanders with females in their units should be made aware of differences (weakness) of the female to insure that the right person is doing the correct job to insure success.

I have selected four critical items of difference:

- Body strength--Women are and will probably be only 30 to 50 percent as strong as males. A 1974 study demonstrated a 30 percent increase in strength in women after a 10-week training program.

- Reaction time--A male's reaction time is faster than a woman's. Reaction time, even with training, is difficult to improve.

- Percent body fat--Body composition in terms of fat to lean body mass is higher in women than in men. The female will have to expend more energy to do the same job as the male.

- Maximum aerobic capacity--In trained subjects--male and female--the difference is 20 to 25 percent in favor of the male. It is unlikely that the female, trained or untrained, will be able to sustain a submaximal work rate for as long as the male.

Regardless of the physiological and anthropometric differences, women *can* outperform the men in some military MOS. However, based on the research available, it is doubtful that the female soldier in a combat role can sustain the energy requirements of an extended fire fight.

Roger D. Kerns  
LTC, USARNG  
Webster, SD

*LTC Kerns cited published studies to support his points. CPT Robison and MAJ McDougal based their articles on extensive DOD sponsored studies.--Ed.*

## Women in the FA

In the November-December 1978 *FA Journal*, the enthusiastic articles regarding the employment of women in FA units make me wonder just what kind of publication the *Journal* is. Although the magazine claims its material does not reflect official policy unless indicated, it would be hard to find a more biased, propagandistic viewpoint on women soldiers from the Carter administration itself. Is the *Journal* merely another mouthpiece of DA? Except for the remarks by General Singlaub (which were reprinted from another magazine), there is no recognition given the fact that the overwhelming majority of Field Artillerymen--officers, NCOs, and enlisted--strongly oppose permitting females in their units.

No one should think that this new policy of assigning women to some Field Artillery units is merely the inevitable result of an inexorable process. Rather, it is based on the arbitrary decision by Secretary of the Army Clifford Alexander, shortly after he assumed office with the new administration in January 1977, to follow the recommendations of the Brookings Institution, an ultra-liberal civilian "think-tank," catering mainly to the left wing of the Democratic party. Indeed, this policy is so permeated with the liberal penchant for social experimentation, no matter what the cost (human and financial), that is manifestly a political action, serving the ends of a partisan administration determined to inculcate in every facet of society its own peculiar *weltanschauung* [German for perspective].

The reasons to resist the placement of women in FA (or other combat units) have been discussed so many times that I will not do so here. Suffice it to say that the United States is the only nation in the world even considering the possibility of putting women in combat units. Surely, as General Singlaub says, we should carefully consider Russia and Israel, both of which have used women in battle, yet now reject the idea of female combat troops. That should tell our social engineers *something*.

Those of us who feel strongly about women in combat believe such a policy may well seriously degrade the battle worthiness of the combat arms. Believing this, Mr. Alexander's decision seems so dangerous that I believe it is the duty of all officers who oppose it to protest the policy to their commanders and even their US Senators and Representatives. The officer corps can no longer stand idly by and acquiesce in partisan political decisions which directly affect the future of the Armed Forces.

Gerald D. Martin  
1LT, FA  
Fort Hood, TX

*Your letter is appreciated. The emphasis on women in the Army (and in the Field Artillery) in the November-December 1978 Journal was intended to serve two purposes: provide factual information and provide opinion to stimulate discussion.*

*In answer to your question "What kind of publication is the Journal?", I would say it is a source of news of events with impact on our branch and an open forum for opinion on issues of professional interest. Your Journal has no "ax to grind" and is not a mouthpiece for anyone except the FA branch as represented by its individual members who submit material.*

*For those readers who found the November-December issue biased, extreme efforts were taken to make the overall magazine as balanced as possible to help prepare our previously all-male units for the arrival of women by energizing the mental processes and providing some factual foundation for easing the mandated transition.--Ed.*

## Keep the debate cool

I expect discussions pro and con of women in the Army, particularly combat units, to be charged more with emotion than logic. However, I need to comment on "The Artillerist" written by MAJ Winn B. McDougal (*Field Artillery Journal*, November-December 1978). I would respond to Major McDougal's question "How many men have carried a 60-pound child on their hip for hours?" with the question "Why

would a woman carry a 60-pound child on her hip for hours?" The average 60-pound child has been walking for six to seven years! If this was a typographical error, I apologize to Major McDougal; if it was a feeble attempt to prove a point by emotional exaggeration--stop it! The subject of women in the Army has already been overloaded with this type remark.

Lawrence K. Combs  
MAJ, AR  
Fort Sill, OK

*Though we had some typos in that issue, the "60-pound child" wasn't one of them.--Ed.*

## Get your own Journal

In the summer of 1977, I became President of the Field Artillery Association. Quickly I discovered that the heritage and esprit Redlegs talk about is given only lip service by large numbers of Field Artillerymen. There is no question that we Redlegs are a proud lot but hesitate to put forth the effort to help sustain our tremendous heritage. Until recently, the Field Artillery Association only had 500 members; that's right, 500. Now we have more than 2,000 members--thanks to some spirited Redlegs. The *Field Artillery Journal* is automatically sent to each member. The annual subscription rate for the *FA Journal* is included in FA Association membership dues. I am sure that there are hundreds of Field Artillerymen who never see our fine publication because they are not aware of how to get a personal copy. In addition to receiving your own copy of the *Journal*, by joining the Association you will contribute directly toward sustaining our tremendous heritage. We, as Artillerymen, should be proud of our fine publication and help spread the word. "Join the Field Artillery Association--get your own *Journal*."

James W. Wurman  
COL, FA  
Director, Gunnery  
Department

## Incoming

### **Modified multipurpose protractor**

In the September-October 1978 *FA Journal* an article appeared about a multipurpose protractor having been developed. We at the 2nd Battalion, 81st FA, have been using a similar protractor since December 1976. I developed it and it was produced by Training Aids in Rudelheim.

The protractor has proved to be a versatile piece of equipment. In addition to using it in the operations/intelligence area, my battery uses it during emergency missions or "hipshoots." With the device, the XO can determine an azimuth to target (used as the azimuth of lay) and a range to target. With the aid of a graphical firing table, the elevation can be obtained.

Successive executive officers of C Battery have refined the basic model to increase speed and accuracy. 1LT Edward J. Erickson incorporated the quick fire rule from the March-April 1977 *Journal* so the XO no longer has to carry a GFT. All the XO needs is the protractor with rule attached and a map to fire a complete mission. An emergency mission can be completed in less than three minutes from the call for fire to the fire for effect, using the protractor.

The modified protractor enables relatively untrained personnel to put steel on the target. Almost anybody with a basic knowledge of map reading could, after about five minutes of training, accurately compute a basic HE/quick fire mission and determine subsequent corrections. A howitzer section chief surviving the havoc of massed counterfires could effectively direct the battery in basic low angle missions. However, that same chief left with a FADAC, RDP, or a hand-held calculator would be incapable of anything but direct fire.

Several problems exist with the piece of equipment as it is now. Listed below are some common problems with suggested remedies:

- Dirt tends to get between the arm and the circular scale. No solution has

yet been developed.

- The numbers and graduated lines wear off with use. A short term remedy is to cover the markings with plastic which is a tedious task. A better solution would be to etch the plastic, and then paint the markings.

- It is difficult to center the circular scale on a map over the chosen battery location. We solved part of the problem by etching two lines on the disc going from 0 to 3200 and from 1600 to 4800 as in the Fort Sill model. In addition we drew large numbers for the 0, 1600, 3200, and 4800 mil graduations. Finally a small hole in the middle was added to allow a standard plotting pin to hold the protractor over the battery position.

- The present range of the TFT extract is from 3,500 to 9,000 meters. However, by printing the TFT extracts on both sides of the sliding rule, this can easily be expanded without an increase in size.

- The arm covers the lower azimuth numbers. The arm should be reversed as on the multipurpose protractor.

Griffith T. Lewis  
CPT, FA  
C Btry, 2-81st FA  
APO New York

*Thank you for your suggestions. It is for just this sort of idea exchange that the Journal exists.--Ed.*

### **TVI--great system**

"The 1st Battalion, 14th Field Artillery, is rated satisfactory."

Thus, the first unit to receive the new Technical Validation Inspection (TVI) conducted by Forces Command remained certified as nuclear capable. Just two weeks earlier, the "Battle Kings" had successfully completed all 11 nuclear tasks incorporated into the Army Training and Evaluation Program (ARTEP) by Change 1 to ARTEP 6-365.

The TVI team inspected technical operations, special weapons publications, and the administration of the Personnel Reliability Program. This inspection was conducted in a training bay with representatives from Department of the Army, Forces

Command, III Corps, and 2d Armored Division observing the very confident soldiers of the 1-14th.

This confidence was a result of the soldier knowing he could perform both conventional and nuclear tasks simultaneously. The nuclear portion of the ARTEP was realistic and tactically oriented. Gone were the spit shined guards and the showcase vehicles. In their place, the soldiers found the realistic pressures of long hours of hard work and constant demands for alertness. The special weapons vehicles were required to be combat ready for an extended period of time while being used for their primary conventional functions. The demands of the battalion's assets were far flung and constant. Transporting the prescribed nuclear load (PNL) in M520 Goers placed great demands on all vehicles and required the highest state of maintenance.

The officers and soldiers eagerly accepted the challenge of the TVI and the nuclear ARTEP. When battery commanders and other battalion officers were questioned by COL Robert Schweitzer, Office of the DAIG, they were unanimous in their opinion that the ARTEP/TVI program is a significant improvement over the old Nuclear Surety Inspection.

The key to success for the ARTEP and TVI is to integrate nuclear tasks into every field training exercise. The well-trained Battle Kings have done this.

Manuel Lopez  
LTC, FA  
1st Battalion, 14th  
Field Artillery  
Fort Hood, TX

### **ARTEP misunderstanding**

An Army Training and Evaluation Program (ARTEP) is a *publication*. It contains the minimum performance standards for critical tasks required of a specific type unit. It also provides guidance for the conduct, supervision, and evaluation of training to achieve the desired performance.



Three articles in the September-October 1978 issue of the *Field Artillery Journal* reflect and support the misuse of the acronym "ARTEP" to describe a field exercise.

In COL Henry R. O'Neil's "How Effective Is Our Team," he literally equates ARTEP and field exercise. He even measures an ARTEP in days!

MAJ William E. Tyson makes the same error in describing a combined arms exercise as an ARTEP in "A Combined Arms ARTEP--It's Not Impossible." He should have identified the tasks, conditions, and standards for the operation. Then he would have had something at least akin to an ARTEP. If he added a description of the resultant performance and a diagnosis of discrepancies in desired performance, he would then have an ARTEP-based exercise. Your clarifying comments only serve to reinforce his misuse and misunderstanding of an ARTEP.

Finally, LT David Vogels' "Hipshoot!" provides a vivid description of excellent, performance-oriented training. Unfortunately, he doesn't seem to recognize that the competition is based on a blending of tasks contained in ARTEP 6-365.

The ARTEP is a powerful instrument designed to support performance-oriented training. Continued misuse and misapplication will result in a continuation of the exposure-oriented systems that are little more than exercises in self-aggrandizement. The Field Artillery School has been a leader in producing training systems designed to achieve battlefield performance. In support of that School and keeping with its stated purpose, the *Field Artillery Journal* has an obligation to insure proper understanding and use of the "tools-of-the-trade."

Joseph F. Castro  
COL, Engineer  
USA Readiness Region IX  
Presidio of San Francisco,  
CA

*During the past two years, the Journal has done all within its power to encourage proper use of the ARTEP. Your attention is invited to the following as prime examples:*

- *March-April 1977 Journal*  
--"Editor's Notes," page 2.  
--"The GS Battalion ARTEP," page 52.
- *September-October 1977 Journal*  
--"The Conventional Nuclear ARTEP," page 9.  
--"Do You Really Understand the ARTEP?" page 20.

*The ARTEP does contain specific tasks, conditions, and standards, but they are related to unit operations, which, if you subscribe to the philosophy "train as you will fight," should be evaluated in the field in a combined arms scenario.*

*Colonel O'Neil's and Major Tyson's articles are simply trying to inject some realism and variety into the conduct of the training and its evaluation.*

*We certainly regret any misunderstanding of our motives or doubts about our full support for the ARTEP as an extremely valuable training device for the commander.*

*Since you mention it, this is a good time to remind our readers that the Journal content does not reflect School policy except in "On The Move" and "View From The Blockhouse."--Ed.*

#### **Missed the point**

Reference is made to my paper, "Field Artillery--King of Battle," published as a letter to the editor in your November-December 1978 issue.

I really do not understand why you published it. Your editing changed the meaning completely. Intended to provoke some sparks and to stimulate meaningful dialogue, you made it reflect the same old motherhood and sin. You took out the unique heart and displayed the well-known traditional bones--to an end that escapes me.

Further, I fail to understand why you carefully deleted all references to electronic warfare. Your September-October issue encouraged

me that the FA really was "getting with it." First, your centerfold (on electronic warfare) was simply outstanding. It was comparable, to me, to the early *Playboy* centerfolds in its departure from tradition. It was further evidence that we are getting EW out from behind the green doors and into the battle arena where it belongs.

You have destroyed any notion I had that you are interested in novelty and innovation. I am sorely disappointed.

Edward J. Morgan  
COL (Ret), FA, USAR  
Cincinnati, OH

*Our apologies for missing your point. Contrary to your conclusion, the Journal and the School are vitally interested in novelty and innovation.--Ed.*

#### **Feedback on trainees**

As a Field Artillery officer serving in a non-Field Artillery assignment, I find that the *Journal* does a great job. I look forward to its arrival and thoroughly enjoy its content. The thought strikes me that the *Journal* could perform still another service.

I am serving as the Commander of the 4th Combat Support Training Brigade at Fort Jackson, SC. We receive young soldiers fresh out of basic and train them in MOSs 71L, 75D, 75E, 76Y, 94B, and 63B. While in AIT, we bring them to skill level I. The bottom line is simple--we need feedback from the field.

These young men and women are shipped world-wide to Active Army, Reserve, and National Guard units. Drop a line to Commander, 4th CST Brigade, Fort Jackson, SC 29207 and tell us how these people do. We want the good news and the bad news. We are dedicated to producing the best possible soldier.

C. C. Nock  
COL, FA  
Fort Jackson, SC

# TACFIRE

## *Where do we go from here?*

by MAJ John E. Martin

*The full-scale production decision for TACFIRE has generated some fundamental questions regarding deployment, training, and changes to tables of organization and equipment to support TACFIRE. To answer these questions, the TRADOC TACFIRE Systems Manager has provided some insight into what the changes are and when they will go into effect. — Ed.*

### **Where does TACFIRE stand today?**

A favorable decision to produce TACFIRE by the Army Systems Acquisition Review Council on 19 October 1978 and concurrence by the Secretary of Defense on 30 October 1978 are major milestones affecting the future operations of the Field Artillery. The efforts of material and training developers have succeeded in setting up the performance and training criteria for TACFIRE to such a degree that the system has been type classified standard for all active duty FA units.

The 1st Cav Div Arty was the user during TACFIRE's Operational Test III (OT III).

### **What was 1st Cav's reaction to TACFIRE?**

The best way to answer this question is to quote the executive summary of the OT III after-action report prepared by the 1st Cavalry Division Artillery.

"It is the conclusion of the Division Artillery chain of command that the TACFIRE system is extremely effective and greatly enhances the artillery support provided by the division artillery. Some modification to the equipment and procedures will further enhance the capabilities of the TACFIRE system. These modifications should not be allowed to detract from the fact that artillery support is vastly improved with TACFIRE. A division artillery simply could never have accomplished its mission in the [test] scenario with a manual system. Our conclusion is that the TACFIRE system is both effective and necessary to optimize the firepower of a division artillery. Minor modifications to the equipment and

system procedures will provide the US Army with the necessary command and control for the war of the future."

Most of the modifications advocated by the 1st Cav Div Arty have already been completed.

### **What are some of these modifications?**

We've established the capability to prioritize fire missions, speed up transmission time, increased the number of direct support repairmen for the div arty, and came up with a smoother means for a direct support (DS) battalion to "hand off" a fire mission to its reinforcing battalion. The TACFIRE software is extremely flexible, meaning that it can accommodate changes, and we can expect to see many more improvements to the system as more artillerymen have an opportunity to work with it and recognize its enormous capability.

### **TACFIRE is a tactical automatic data processing computer, but what does that mean to the FA battalion commander?**

The TACFIRE system improves command and control of the fire support system. It does this by providing computerized digital communications, automated processing of normal FA functions, rapid dissemination of the results of processing, and immediate feedback. TACFIRE's data collection and summary features will free fire support personnel from many tedious, routine, and often error-prone tasks. TACFIRE will allow personnel to concentrate on analyzing alternatives, allocating resources, and determining the best mix of weapon system, munitions, and volume of fire for targets. Basically TACFIRE accepts and coordinates commander's criteria statements (priorities, desired effect, ammunition, etc.) and fire support coordination measures, performs artillery fire planning, automates the conduct of fire, and reports target intelligence and ammunition and fire unit status automatically. These reports provide the basis for the commander to continuously evaluate the tactical situation and make decisions, based on more complete information.

**Do users of TACFIRE require an automatic data processing background?**

Absolutely not! Obviously an automatic data processing background is helpful when dealing with any computer; however, operational testing and field operations at Fort Hood proved that this is not a necessity. Operator/organizational level courses at Fort Sill have included soldiers from privates to lieutenant colonels and have also produced some pleasant surprises from the junior enlisted men in MOS 13 and company grade ranks. That a young private can assimilate artillery operations and employ directed command and control techniques with a sophisticated piece of hardware is a real tribute to the design and training developed for TACFIRE, and certainly to the soldier who operates it. As a matter of fact, we had a 96 percent success rate in training 1st Cav personnel as users for OT III. We have also had some not-so-pleasant surprises. The operator's manuals are about two feet thick. A change in software requires a change in the manual and in the training material. Changes to the software have proved to be relatively easy, whereas style and content of the manual and training material to describe how an operation has changed have been more difficult. No two people think exactly alike, and terms must be selected that achieve universal understanding.

**Are there communication problems?**

First of all, with TACFIRE the Field Artillery has taken the first step in accomplishing source data automation. The person who puts information into the system is the source. The computers do not transpose numbers, confuse charges, or misinterpret data. With TACFIRE, if a message is correct, it goes in and goes to work; if not, it doesn't get in. Now that may appear to be a pretty tough standard; however, if we do not work in this manner we could have real problems later on. In this sense we have solved a major communication problem — correct interpretation of information.

Another communication enhancement is speed. A voice call for fire runs about 20 seconds from start to the last repeat at the receiving end. With TACFIRE, a digital call for fire takes a bit less than three seconds with an acknowledgement. The guns can be responding within 16 seconds after the first transmission. Other kinds of information move much quicker and more accurately than with manual means.

TACFIRE does have a communication problem. It's not the TACFIRE equipment as much as it is the Army's communications system. Digital communications require *quality* in any mode in which they are employed. If the quality is not there, you are not communicating. We are making great strides in adjusting

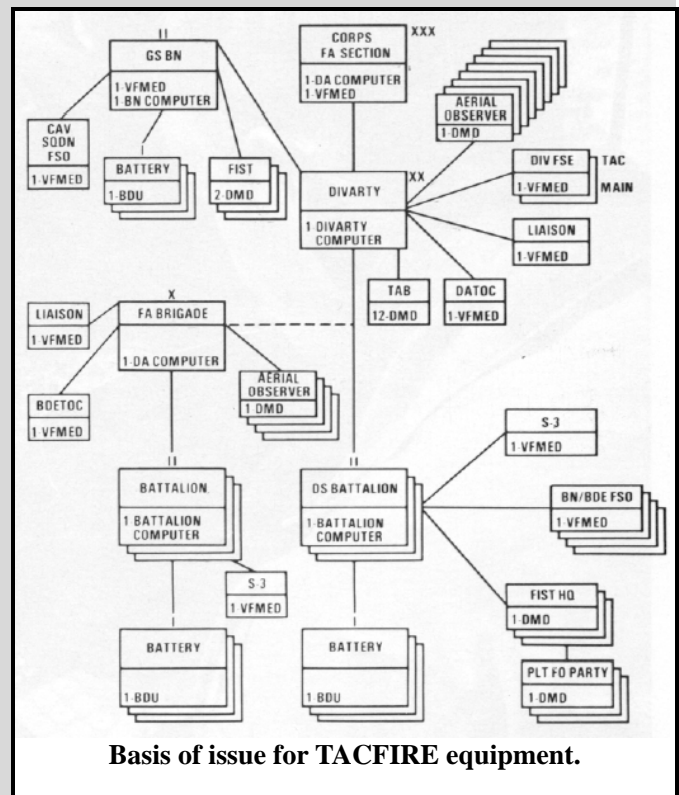
various modes in which TACFIRE can operate and in upgrading radio and wire circuits available to the Field Artillery. One example of this upgrade is the development of doctrine which allows Field Artillery battalion computers to use a pulse code modulation circuit to exchange information with the div arty computer.

**What about communications security?**

TACFIRE operates over existing Field Artillery communications nets. Nothing new has been added. It is correct to state that the FDC can be targeted since it has such a peculiar electronic signature, but, through the use of digital communications, much more information can be transmitted in a shorter period of time. Further, as other systems are fielded using similar digital communications, TACFIRE will not stand out with a unique "signature." The radio nets are less active with digital traffic than with voice traffic passing the same data, thereby making them more difficult to locate. Enemy jamming appears less effective against digital communications, unless the jamming is continuous. Continuous jammers very quickly become targets themselves.

**What about maintenance?**

There are a lot of circuit cards in TACFIRE. Fortunately TACFIRE is engineered to have only approximately 30 different cards and all of them are in the unit



**Basis of issue for TACFIRE equipment.**

operations sustaining kit. The computer self-diagnoses a failure, isolates it to a major component, goes into that component, and isolates the failure to a series of cards. A modular test set is then used by the TACFIRE operator to isolate the bad card within the series. The card is replaced, and that component is operational. More than 75 percent of all failures can be repaired at organizational level within 30 minutes — by the operator.

#### **What happens when the computer quits?**

First, think about a direct hit on the battalion operations center — all of it — prior to TACFIRE. Operations were difficult at best until you could determine the extent of your loss of control and compensate for it. The only real option under manual procedures was to decentralize control. With TACFIRE, each computer may be linked digitally to another TACFIRE computer,

each sharing on a second-by-second basis what the other is doing. If a major failure occurs in one computer, the other continues the operation.

#### **Will FADAC and manual charts be retained with TACFIRE?**

For a while. When a battalion receives TACFIRE, it will lose its FADAC. The batteries will retain their FADACs and charts until they receive the Battery Computer System (BCS); then they will give up the FADAC. The Field Artillery School (USAFAS) is currently developing the requirement for a backup for the BCS at battery or platoon level.

#### **What does a typical battalion require in the way of equipment?**

- Two 5-ton trucks.
- One battalion TACFIRE computer system.

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A fire support team (FIST) chief communicates fire commands to TACFIRE using the digital message device. Also pictured is the laser locator-designator that interfaces with TACFIRE.



- One S280 shelter with TACFIRE.
- Two 15-kw generators (one power plant).
- Each fire support team gets from three to five digital message devices (DMD).
  - Each fire support element liaison team and the battalion S3 gets a Variable Format Message Entry Device (VFMED).
  - Each firing battery gets a Battery Display Unit (BDU).
  - Encryption devices, phones, etc.

**What about equipment for the division artillery FDC?**

- Four 5-ton trucks.
- One div arty TACFIRE computer system.
- Two S280 shelters.
- Four 15-kw generators (two power plants).
- Four Variable Message Entry Devices.
- Six 1.5-kw generators.
- Each aerial observer get a DMD.

**How about equipment for the Reserves and National Guard?**

Currently there are no definite plans to equip either the Reserves or National Guard with TACFIRE. However, we are investigating a means to *train* these units to use TACFIRE. The major limiting factors are money and training time.

**What about personnel changes?**

The USAFAS has proposed a separate MOS of 13C for TACFIRE positions at skill levels 1 through 4 (E1 through E5). If approved by Department of the Army, MOS 13C would not be implemented until late 1979 or early 1980. Additional skill identifiers will be assigned to MOS 13F and 17C soldiers who receive TACFIRE training. TACFIRE TOEs have provided additional personnel for each FA battalion FDC for 24-hour operation and a warrant officer for TACFIRE equipment maintenance at each div arty and FA brigade for technical expertise. Overall, there is a net reduction of personnel throughout the active force.

**Will there still be the same flexibility of changing officer assignments within a unit?**

Basically yes; however, battalion and div arty FDOs must have TACFIRE training. Movement of captains within units must be more prudent than before.

**When will units receive TACFIRE?**

The deployment schedule itself is classified, but three divisional slices will receive TACFIRE in 1980 and approximately nine divisional slices each year after that until all active units have been equipped. The big thing

to remember about TACFIRE is that training drives deployment. No one will receive TACFIRE until their unit has been trained.

**How did Fort Sill train the 1st Cav?**

The TACFIRE training program was formed after all tasks involved in the operation and maintenance of the TACFIRE system had been carefully analyzed. Through the detailed "front end" system engineering process, a team of subject matter experts examined each task associated with TACFIRE. The analytical team picked only the critical tasks and duty positions associated with these tasks, culminating in six courses of instruction to meet the training needs. These six courses train individuals for a variety of duty positions. It should be clearly understood that institutional training for the individual soldier was kept to a minimum *by design*, and represents *only* phase I of a two-phase comprehensive training program. Phase II training is conducted in the unit by new equipment training teams during initial deployment and later by officer and NCO trainers from within the unit. This "structured OJT" program was designed to complement individual institutional training. Graded, supervised, practical exercises were designed to build individual skills and *to train battalion and div arty FDCs, FSEs, etc.*, to operate as a *confident, competent team*. This training is further reinforced by detailed SOPs, ARTEPs, and unit procedures similar to those employed by Field Artillerymen for decades. Through careful planning, supervision, and a professional approach to TACFIRE employment/utilization, a unit possessing TACFIRE equipment is transformed (through much hard work) into a "TACFIRE battalion" or a "TACFIRE FSE." Training is more demanding with TACFIRE; it must be conducted by *units*. This training concept has not been the norm in the past, but it must be now.

**Is this how all units will receive their training?**

Yes, except that phase I instruction is being converted to skill performance aid (SPA) training, formerly called integrated technical documentation and training (ITDT). This new training concept resulted after extensive design definition and review. Particular emphasis has been applied to the use of individualized, self-paced, multimedia instructional techniques to reduce the recurring cost of resident school training for increased long-term student loads. In addition, SPAs provide exportable training lessons for in-unit field training. Thus, unit readiness can be maintained or increased through training after the completion of resident instruction. Depending on time and equipment availability, a limited number of personnel may also be trained in the field using such an approach.



A fire direction officer and fire direction sergeant are seated at the Artillery Control Console of a Field Artillery battalion TACFIRE set.

Currently the Office of the TRADOC Systems Manager, together with the TACFIRE Project Manager, is monitoring the development of 258 self-paced, exportable, TACFIRE training lessons encompassing all aspects of TACFIRE operation and organizational maintenance at each Field Artillery echelon. These lessons represent a combination of audio-visual (TEC) lessons, programmed texts, and computer-assisted instruction designed to be used on the tactical TACFIRE hardware in each battalion. In addition, 21 computer-driven "team training" lessons are being produced to exercise a complete FDC without having to communicate with FSOs, FOs, div arty, or a "continuity of operations" battalion. This approach to the most demanding aspect of TACFIRE training will insure that

the commander has the capability to train and evaluate his computer center against a realistic enemy scenario.

**What are a commander's responsibilities during transition and afterward?**

The commander must understand the TACFIRE training concept, what is achieved in each phase, and the structured individual and unit OJT programs. He must not confuse the level of proficiency that can be achieved through training with that achieved *only through experience*. Above all, he must remember that training programs do not just happen. They are built on careful analysis of a soldier's needs, the mission of his unit, real-world time, personnel and monetary limitations,

and the capabilities of modern weapons systems. The TACFIRE training program recognizes the real-world needs of the soldier, while being cognizant of instructor, equipment, and time constraints. The unit and School must be full partners in the achievement of the ultimate TACFIRE training goal. Through such a partnership, we will move closer to a fully trained, combat-ready force. Anything short of this goal will degrade our performance on the modern battlefield.

**Will all units receive their phase I training at Fort Sill?**

Yes and no. All DS maintenance personnel within a unit will be trained at Fort Sill because of the student-to-instructor ratio and equipment. Other personnel who require institutional training and are stationed in CONUS will be trained at Fort Sill. Personnel in Europe will be trained at the Seventh Army Combined Arms Training Center.

Phase I training was designed to train the minimum essential TACFIRE positions. A division artillery has 311 positions which require some form of TACFIRE training. Only 125 of these will receive phase I training. The remainder will receive their initial instruction and proficiency training from the new equipment training team at their unit location.

**What about doctrine?**


TACFIRE is engineered to support existing doctrine of FM 6-20. Doctrine "built" this machine — the machine has *not* built doctrine. TACFIRE was built to support and survive in the target-rich battlefield environment of the 1980s. Programable computers are similar to the mind of man in that they can change, where required, to support new doctrine. On the other hand, the capabilities of machines will frequently influence changes in doctrine.

**What about TACFIRE's interaction with the other new FA systems?**

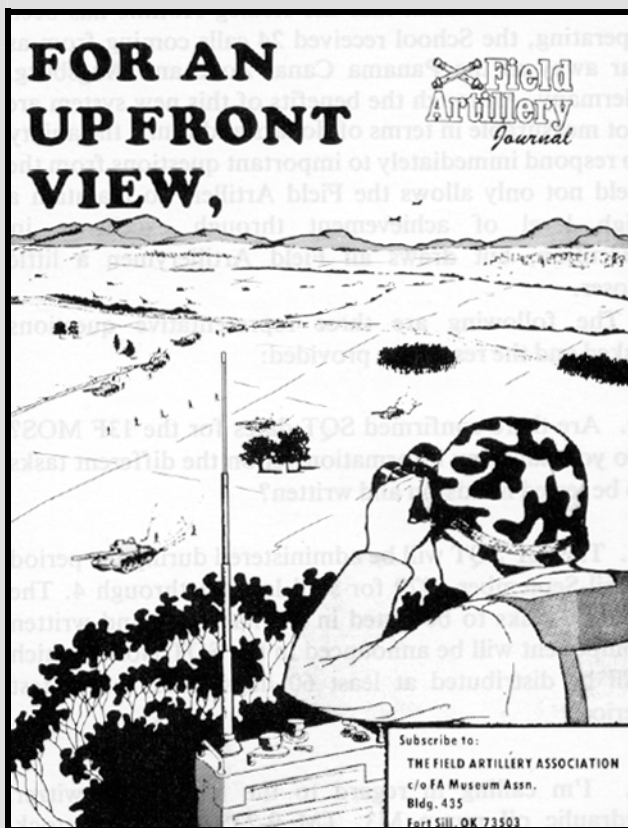
TACFIRE is much more than a larger, more capable FADAC used to process fire missions. It is an electronically integrated command and control system as well. TACFIRE furnishes the basis for the complete integration and dissemination of information developed by elements of the fire support system. This is of particular importance in view of sophisticated equipment currently being developed. Many developmental items are designed to automatically transmit information directly to the TACFIRE computer.

Field Artillery developmental items that will communicate with TACFIRE include counterfire radars AN/TPQ-36 and AN/TPQ-37, the BCS, an automatic met station (FAMAS), a laser rangefinder (GLLD), and

remotely piloted vehicles. By providing a common control system with which all of these systems will operate, TACFIRE will integrate them into an effective team.

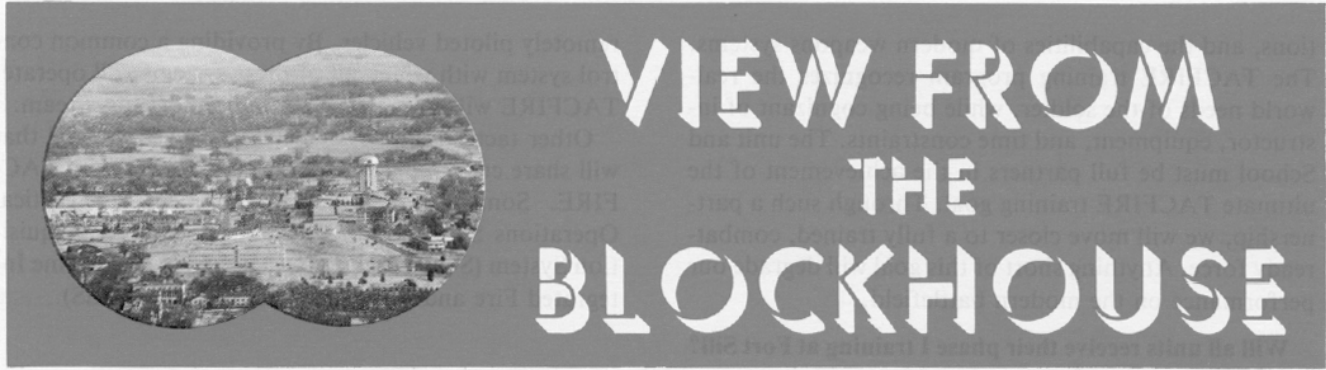
Other tactical data systems are being developed that will share communications and information with TACFIRE. Some of these are the maneuver's Tactical Operations System (TOS), a Standoff Target Acquisition System (SOTAS), and the Marine Corps Marine Integrated Fire and Air Support System (MIFASS). 

**MAJ John E. Martin is Chief of the TACFIRE Training Branch, Directorate of Combat Developments, USAFAS.**



**Moving? Subscribers should send their new address four weeks in advance to:  
Field Artillery Association  
c/o Fort Sill Museum  
Fort Sill, OK 73503**

## Notes from the School



### Redleg Hotline works!

In the first month that the Redleg Hotline has been operating, the School received 24 calls coming from as far away as the Panama Canal Zone and Augsburg, Germany. Although the benefits of this new system are not measurable in terms of dollars and cents, the ability to respond immediately to important questions from the field not only allows the Field Artillery to maintain a high level of achievement through excellence in execution, but draws all Field Artillerymen a little closer.

The following are three representative questions asked and the responses provided:

Q. Are there confirmed SQT dates for the 13F MOS? Do you have any information yet on the different tasks to be tested hands-on and written?

A. The 13F SQT will be administered during the period April-September 1979 for skill levels 1 through 4. The specific tasks to be tested in the hands-on and written component will be announced in the SQT Notice which will be distributed at least 60 days prior to the test period.

Q. I'm calling in regard to the M109A1 howitzer hydraulic oil pump M3, TM 9-2350-217-23-2, stock number 49330044497166, page 559. The stock number has been deleted and the support agency over here has been unable to find a replacement. I need it. Has it been deleted? Is there a new pump to replace it?

A. The item is still in the supply system. The oil pump is in Supply Catalog (SC) 4933-95CL-A12, 11 June 1969, figure 55, page 11, NSN 4933-712-2378, pump kit, hydraulic oil, gun recoil M3, \$191.00. This NSN has been verified against the October Army Master Data File.

Q. My battery is organized under MTOE 300-62 and

we've been informed that a new MTOE 300-64 will be going into effect. When will the new MTOE 300-64 be going into effect? Will that MTOE include the BOC equipment and vehicle and also speakers for the howitzers?

A. HQ, FORSCOM will publish a change to the unit's MTOE adding the required equipment for the BOC and loud speakers for the howitzers. This change should be received in the unit during January 1979 with an effective date of 16 March 1979.

### Senior Commanders' Conference

The 1978 Senior Field Artillery Commanders' Conference was held at Fort Sill from 14 to 16 November. Attendees represented 15 division artilleries, seven FA groups, two FA brigades, four corps artilleries, the Marine Corps field artillery, service schools, and other key military command and staff agencies.

The conference provided senior Field Artillery commanders a forum for the exchange of information and ideas and provided an opportunity for the commanders to be brought up to date on FA doctrine, tactics, and materiel. The agenda included an overall update by the FA School in the areas of weapons, doctrine, training, combat developments, fire support, and nuclear weapons.

Attendees from Europe provided input on REFORGER 78 and the Seventh Army Training Center at Grafenwoehr. CONUS agencies and commands presented briefings on such topics as the Special Inspection Army. Nuclear Matters; Nuclear Contingency Study presented by Sandia Lab; Combined Arms ARTEP presented by the 101st Div Arty; Officer Personnel Distribution presented by MILPERCEN; and the Division Restructure Study presented by the 1st Cav Div Arty.



## Artillery Hall of Fame marks 10 years

Fort Sill's Artillery Officer Candidate Hall of Fame marked its 10th anniversary in 1978. Photographs or paintings of artillery officers who have distinguished themselves in three of the Nation's wars and achieved individual national prominence are displayed in the Hall of Fame.

Presently located in building 441 near the Field Artillery Museum, the Hall of Fame is perpetuated and maintained by the Society of Graduates of the Artillery Officer Candidate School, a private organization established in December 1968.

For induction into the Hall of Fame, the nominee must be a graduate of the former Fort Sill Artillery OCS or the Fort Riley, KS, OCS between 12 December 1946 and 21 February 1951; be commissioned in the Field Artillery; and meet one of the following requirements:

- Be a recipient of the Medal of Honor or Distinguished Service Cross.
- Attain the rank of colonel on active or inactive status.
- Be appointed or elected to an office of national prominence.

First among the Hall of Fame's distinguished ranks are ILT James E. Robinson Jr., who was posthumously awarded the Medal of Honor for his actions in an attack near Untergreshein, Germany, in 1945, and 2LT Harold B. Durham Jr., who was posthumously awarded the Medal of Honor for his actions while serving as a forward observer in Vietnam in 1967.

Former Secretary of the Army Martin R. Hoffman, a 1955 graduate of the Artillery OCS, and MG Jack N.



**A small portion of the photo display in the Fort Sill OCS Hall of Fame.**

Merritt, present Commanding General of Fort Sill and a 1953 OCS graduate, are among the prominent artillerymen inducted into the Hall of Fame.

The Fort Sill Officer Candidate School operated from July 1941 until July 1973, but the Hall of Fame will continue to memorialize the accomplishments of its graduates.

Nominations for OCS graduates to be considered for induction should be sent to the Custodian, OCS Hall of Fame, Field Artillery Museum, Fort Sill, OK 73503.

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## Nuclear and chemical target analysis training

The Field Artillery School has developed several courses to assist units and individuals with additional skill identifier (ASI) 5H qualification and refresher training.

Initial qualification in ASI 5H may be accomplished by attending the Resident Nuclear and Chemical Target Analysis Course at Fort Sill. This is a self-paced course of 3 weeks and 3 days; however, the course is open-ended and many students will graduate in less time.

Another Nuclear and Chemical Target Analysis Course which provides initial qualification in ASI 5H is the two-phase Nonresident/Resident Course. Phase I is unclassified and is available from the Institute of Professional Development at Fort Eustis. Phase II is one week of classified self-paced resident training at Fort Sill and must be attended within three months of

completing Phase I. This course will award ASI 5H with a minimum of time in residence at Fort Sill. The first resident Phase II is scheduled for 19 August 1979.

Individual refresher training can be accomplished by enrolling in the Nonresident Nuclear and Chemical Target Analysis Course Refresher, USA Training Support Center, ATTN: AIPD, Newport News, VA 23628. Successful completion meets the requirement for refresher training in ASI 5H.

Major commands that wish to conduct formal classified refresher training of groups of personnel may order the required material for refresher training directly from the Field Artillery School, by writing:

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

or calling Autovon 639-3673/6209.

## View From The Blockhouse

### **GSRS is MLRS**

Don't be confused if you hear our general support rocket system (GSRS) referred to as MLRS, or multi-launch rocket system. With NATO interest and cooperation in the GSRS, the Europeans have selected the more generic name, MLRS, for referring to the system.

Developmental competition for the contract to build GSRS is progressing on schedule.

### **New FADAC tapes**

Three revision 5A FADAC tapes have been produced to add more current ballistic data and to include certain munitions for the M109A1, M110, and M110A1 howitzers.

#### **M109A1 tape (NSN 1290-01-067-0396)**

The new tape has deleted M483 data and replaced it with data for the M483A1 dual purpose ICM projectile. The same projectile flag is used for the M483A1. Flag cards should be annotated to reflect the change. The M483A1 can be fired in two modes: ICM airburst and self-registration. To use the M483A1 with the M577 time fuze and achieve an airburst, use projectile flag 10 and fuze flag 7. To register with the M483A1 and the M577, use projectile flag 10 and fuze flag 6. The updated M109A1 tape will display the following at the conclusion of Program Test 1: 1000000005100255. The 1 in the 11th position identifies that the tape is the updated version.

#### **M110 tape (NSN 1290-01-066-6091)**

The new M110 tape has deleted M422/M424 data and replaced it with data for the M422A1 NUC and the M424A1 HES projectiles. Projectile and fuze flags are unchanged. Flag cards should be annotated to reflect the change. The update M110 tape will display the following at the conclusion of Program Test 1: 1000000005100008. The 1 in the 11th position identifies that the tape is the updated version.

#### **M110A1 tape (NSN 1240-01-054-6528)**

The new M110A1 tape includes data for the M422A1 NUC and the M424A1 HES. Projectile and fuze flags are unchanged. Flag cards should be annotated to reflect the change. The updated M110A1 tape will display the following at the conclusion of Program Test 1: 100000000510018. The 1 in the 11th position identifies that the tape is the updated version. The 1 in the 14th position identifies the M110A1.

The new part numbers for the three updated tapes are listed below:

M109A1	REV 5A	PN #8213330-126
M110	REV 5A	PN #8213330-127
M110A1	REV 5A	PN #8213315-124

### **Fire Support Conference**

The 1978 Fire Support Conference was conducted at Fort Sill 24 to 26 October. Attendees represented Field Artillery personnel from TRADOC schools, ROTC regions, FORSCOM Readiness Regions and Groups, division artilleries, and representative Reserve Component Field Artillery commands.

The Field Artillery School provided an update on the latest combined arms team doctrine and identified those changes taking place in Field Artillery weapons, tactics, and techniques. The conference agenda included: an FA tactics update; Armor's view of the FIST (presented by the Armor School); fire support coordination for the active defense (presented by The Infantry School); counterfire; FA tactical operations center; communications update; gunnery; weapons; training; fire support of the light corps (presented by XVIII Airborne Corps); nuclear weapons employment; and combat developments. Attendees demonstrated concern with what equipment the Field Artillery presently has and what can be expected in the future. Logistics, improved munitions, maintenance, and equipment improvements were critical topics discussed during the conference. LTC Homer Gibbs, Commander, 1st Battalion, 77th Field Artillery, 1st Cav Div Arty, briefed on the Division Restructure Study implications for fire support. His discussion included the advantages and limitations of the DRS organization and how it impacts on the FA battalion in combat.

To correlate briefings with revent innovations, a display area was set up in the Artillery Room of Snow Hall. Equipment on display included the small unit transceiver, Copperhead, GSRS, AN/TVQ-2 laser range finder, AN/PAQ-1 laser target designator, NBC equipment, and training materials and equipment. Demonstrations, handouts, and audio-visual presentations were used to explain operating techniques and characteristics of the various items of equipment.

One of the primary reasons for the success of the conference was the active participation of the attendees. Old problems were solved and new challenges raised during the discussion periods. Attendees were introduced to points of contact at Fort Sill who could assist with solutions to problems that might arise in their respective units. Although attendees appeared satisfied with the scope and content of the information received, a frequent complaint was that the time passed too quickly and that the conference should therefore be longer to accommodate additional discussion time for each topic. The conference set the stage for continued progress in the Field Artillery and provided a basis for developing the agenda for the 1979 Fire Support Conference-only nine months away.

## **USAFAS leadership changes**

The summer rotation and internal realignments have resulted in some changes in the key positions within the School. Here is the current lineup:

Assistant Commandant--BG Edward A. Dinges, arrived from 3d Armored Division

Deputy Assistant Commandant--COL Jim Holley

Secretary--COL Jack Ridgway

Directorate of Training Developments--COL Bob Hammond, from Gunnery Department

Directorate of Course Development and Training--COL Tom Jones

Directorate of Combat Developments--COL Jim Drummond, from 2d Inf Div Arty

Directorate of Evaluation--COL Chet Cambell

Weapons Department--COL Jack Van Pool

Communications/Electronics Department--COL Jim Carney

Tactics/Combined Arms Department--COL Jack Donohue

Gunnery Department--COL Jim Wurman, from Fort Sill DPT

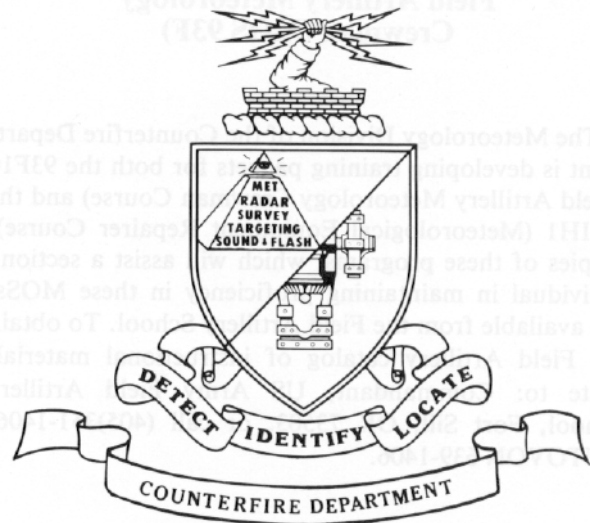
Counterfire Department--LTC Phil Speairs

Commander, School Brigade--COL Bob Hunter

## **FSO suggestions**

Students of the Field Artillery Officers Advanced Course are compiling data for a manual on the "Fire Support Officer and Mortars." Portions of this study will include: the FSO's role in mortar training, the mortar platoon leader's role in fire support, ammunition resupply, and other problem areas encountered in the FSO/mortar relationship. Please send any suggestions or experiences you have had with the subject to:

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



## **COUNTERFIRE SYSTEMS REVIEW**

### **TAB conference held**

A Field Artillery target acquisition battery commander's conference was held at Fort Sill 24 and 25 October 1978. Sixteen TABs were represented—12 Active, three National Guard, and one Reserve Component. There were also representatives from the 2d Marine Division, and Army Readiness Region I. The conference included a series of update presentations that centered on a how-to-train theme. A significant portion of the time was allocated to discussion during each presentation. A half-day seminar was conducted and the attendees exchanged ideas, and presented real-world problems to Field Artillery School representatives.

The conference concluded with a session on the planning and control of target acquisition assets. This session also drew a number of S3s from active division artilleries. The central theme of this exercise was the ARTEP, how-to-train, and how to plan for and employ TAB assets as part of existing Field Artillery doctrine.

The School learned some real-world problems associated with TOE, ARTEP, and SQT requirements. The BCs were able to meet their contemporaries from other TABs and exchange ideas, problems, and solutions. The conference served as a catalyst for Army-wide standardization of TA doctrine as well as a sounding board for TAB-unique problems. Further, it has opened the lines of communication between all the TABs and between the TABs and the School.

## View From The Blockhouse

### **Field Artillery Meteorology Crewman (MOS 93F)**

The Meteorology Division of the Counterfire Department is developing training packets for both the 93F10 (Field Artillery Meteorology Crewman Course) and the ASIHI (Meteorological Equipment Repairer Course). Copies of these programs, which will assist a section/individual in maintaining proficiency in these MOSs, are available from the Field Artillery School. To obtain the Field Artillery catalog of instructional material, write to: Commandant, US Army Field Artillery School, Fort Sill, OK 73503, or call (405)351-1406, AUTOVON 639-1406.

### **PADS and laser rangefinder in survey**

With the fielding of the PADS and AN/GVS-5 laser rangefinder into the direct support artillery battalion survey platoon, the surveyors will be capable of performing a required mission seldom attempted today—target area survey. At present it is difficult for the two conventional survey parties in the battalion to complete the position area survey in a timely manner. However, with PADS and the GVS-5, it is feasible to use the two-man PADS party for position area survey and the five-man conventional party equipped with the GVS-5 to perform target area survey. Test results indicate one PADS is capable of performing a normal battalion's position area requirements in a responsive manner.

The only method of locating critical points in the target area (i.e., registration points, targets of opportunity, and restitution points) is by intersection. Use of the laser rangefinder will add flexibility to the selection and employment of battalion OPs. The requirement to occupy an 01-02 base and observe the same critical point at the same instant is eliminated, because the AN/GVS-5 is capable of determining accurate polar data ( $\pm 1$  mil in azimuth, 10 meters in distance). This will allow better tactical positioning of the battalion survey OPs. When used in conjunction with a T-16 theodolite, distant targets (up to 10 kilometers) can be located with greater accuracy than with any other target acquisition means.

Use of this new equipment will allow artillery surveyors to perform their traditional mission of target area survey quicker and with greater accuracy than ever before.

### **Good news for sound rangers**

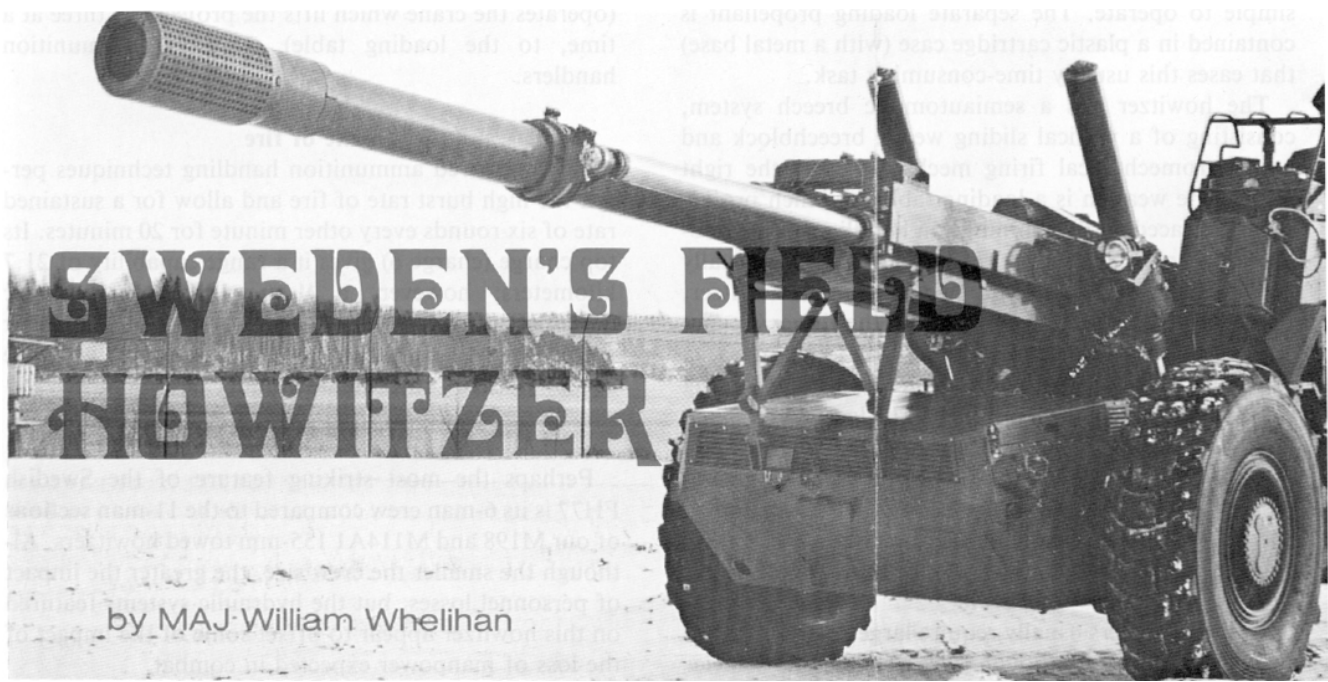
When the Division Artillery Target Acquisition Battery organization was formulated, it was believed the radio data link, AN/GRA-114, would be available to units within two years. Consequently, no wiremen were authorized for the sound/flash platoons and sound/flash personnel were temporarily required to lay their own wire lines. This was a reasonable interim solution since there are 16 personnel authorized for the set-up and operation of the Sound/Flash Control Center. Eight of these personnel could be used to lay the microphone lines while the OP personnel laid the OP lines.

The good news is that the GRA-114 has been type-classified "standard A." A production contract for this equipment will be let in early 1979 and issue to units is scheduled to start in 1981.

The School has been using the engineer development model of the GRA-114 for approximately two years with very good results. This special purpose communication system (replacing the troublesome wire lines), will bring our sound ranging system up to par with the communication and mobility requirements of the battlefield of the future.



**Your "Redleg Hotline" is waiting around the clock to answer your questions or provide counseling for 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.**



**E**xcellent mobility, an impressive rate of fire, and a rapid employment/deployment capability are just three features that make the Field Howitzer 77 (FH77), the Swedish 155-mm auxiliary powered towed howitzer — an attractive addition to that country's artillery system.

Currently being developed and tested by the Bofors company of Sweden, pioneers in hydraulics technology, the FH77 incorporates a number of innovative features that make it a versatile medium-caliber towed howitzer. At a time when increased maneuverability and firepower are needed to offset the Warsaw Pact quantitative advantage and to improve weapon and crew survivability, the FH77's six-man crew uses an auxiliary Volvo engine to improve cross-country and firing position mobility and a sophisticated ammunition handling system that gives it a burst rate of fire of six rounds in 20 to 25 seconds or three rounds in eight seconds.

### **Mobility**

Rough terrain, adverse weather, and the likelihood of counterbattery fire challenge a towed howitzer's ability to move — and move quickly. The desire for longer range (i.e., 20 to 30 kilometers) with medium-caliber weapons translates into more powerful propellants and heavier howitzers. The FH77's 11-metric ton weight (24,000 pounds), about twice that of the M114A1, makes it quite obvious that it will never be referred to as a "light" howitzer. Its air transportability potential is questionable; however, on the ground, it can maneuver and emplace quickly.

Road and cross-country mobility are provided by an on-howitzer Volvo 80-horsepower, 4-cylinder, water-cooled, carburetor engine that provides a maximum self-propelled speed of five miles per hour for the howitzer.

When the howitzer goes off-road, the driver in the cab of the prime mover is able to start the auxiliary engine on the howitzer remotely. This gives the vehicle-howitzer combination four power axles for cross-country driving. The auxiliary engine drives hydraulic motors in the hubs of the two large howitzer wheels, making the howitzer easy to maneuver over rough terrain.

After the howitzer is towed into the battery position, the smaller supporting wheels are hydraulically dropped into position. This action also unhooks the howitzer from the towing vehicle. After the howitzer is maneuvered into position, its spades are dug in automatically by putting the howitzer in reverse. It can be emplaced by one man in a minute and a half.

Although the howitzer's hydraulic system is engine operated, it has a manual capability to permit quiet functioning during night operations and to serve as a backup if the primary power source fails.

### **Ammunition handling**

Although its projectile variety is limited to high explosives, smoke, and illumination (a rocket-assisted projectile is under development), the on-howitzer ammunition handling system is versatile and relatively

simple to operate. The separate loading propellant is contained in a plastic cartridge case (with a metal base) that eases this usually time-consuming task.

The howitzer has a semiautomatic breech system, consisting of a vertical sliding wedge breechblock and an electromechanical firing mechanism. On the right side of the weapon is a loading table on which projectiles are placed by the ammunition handling crane. Propelling charges in cartridge castings are placed manually on the loading tray. There are two seats on the howitzer, one on each side of the breech, for the driver/gunner (left) and one for the loader (right). The loader places a projectile from the loading table directly on the loading tray. The projectile slips into the cartridge case and then the loader activates the rammer. The gunner fires and the case is automatically ejected during the recuperation cycle. This system permits a high rate of fire and also allows a significantly smaller crew.

### Crew

Heavy howitzers usually require large crews — not so with this weapon. Although it is considerably heavier than the European FH70 and the US M198, the FH77 has an auxiliary power unit and a hydraulic system which provide most of the muscle needed for operation.

The gun crew of six consists of a gun commander, a gunner (drives and lays the gun), a loader (feeds projectiles from the loading table to the loading tray and operates the hydraulic rammer), a crane handler (operates the crane which lifts the projectiles, three at a

time, to the loading table), and two ammunition handlers.

### Rate of fire

The improved ammunition handling techniques permit the high burst rate of fire and allow for a sustained rate of six rounds every other minute for 20 minutes. Its top charge (charge 6) gives it a range capability of 21.7 kilometers; however, a "super charge" is under development that will give the system a 23-kilometer range (unassisted) and a 30-kilometer range with the rocket-assisted projectile now under development.

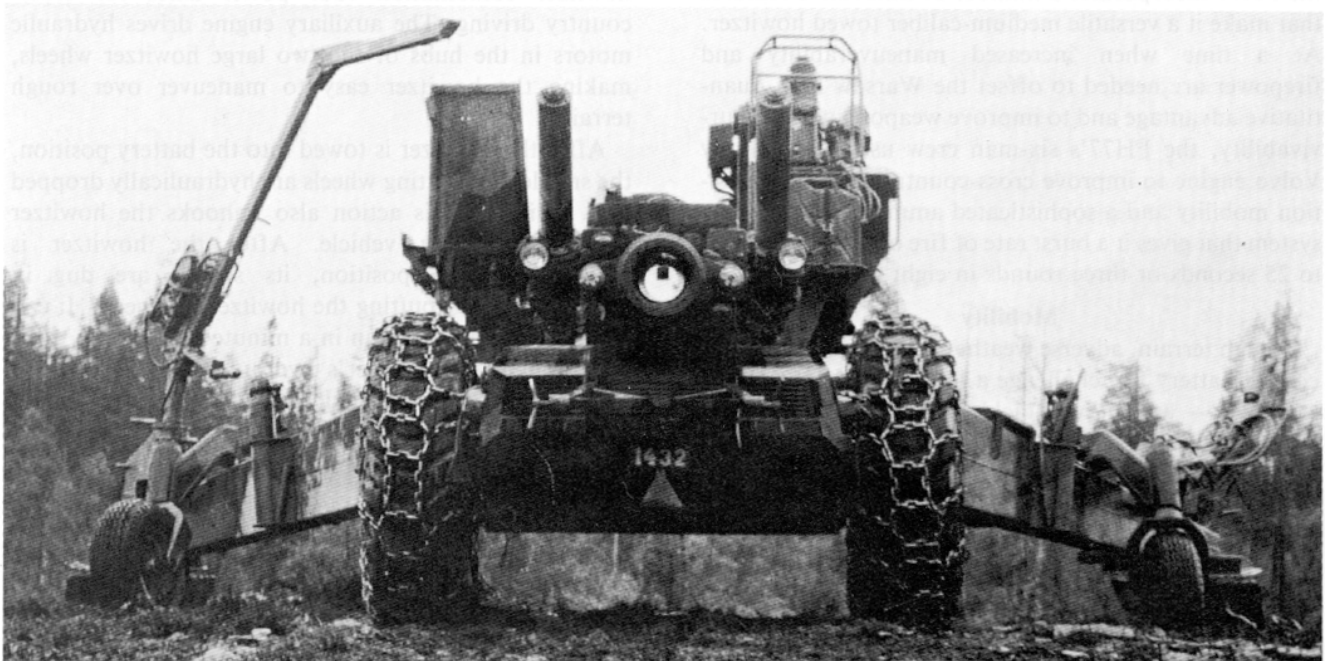
### Analysis

Perhaps the most striking feature of the Swedish FH77 is its 6-man crew compared to the 11-man sections of our M198 and M114A1 155-mm towed howitzers. Although the smaller the crew size, the greater the impact of personnel losses, but the hydraulic systems featured on this howitzer appear to offset some of the impact of the loss of manpower expected in combat.

Ballistic protection to improve survivability for exposed howitzer crews has been a topic of special concern in American efforts. Similar protection for vulnerable key howitzer components is also essential for continuous howitzer operations, particularly highly mechanized/automated systems that have exposed hydraulic lines and auxiliary power unit controls. The

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Sweden's prototype 155-mm howitzer, the FH77, at zero elevation. Note the chains on the auxiliary powered driving wheels for limited self-propulsion and the hydraulic ammunition handling arm at left.



increased vulnerability attributed to the apparent lack of ballistic protection noted with the FH77 may be countered to some degree by its ability to displace rapidly.

The FH77 offers considerable potential for growth with proposed developmental propellants and projectiles. However, in trying to achieve a range of 30 kilometers, the developers must hurdle the weapon obstacles associated with long ranges — a reduction in tube life (wear and fatigue) and a reduction in reliability, availability, and maintainability (RAM) associated with the use of high energy propellants.

### Conclusions

The Bofors Field Howitzer 77, offering innovative features, is an interesting addition to the family of modern towed artillery. Although it does not appear to introduce revolutionary technological breakthroughs that tackle the reliability and durability problems we face with heavy, long-range medium-caliber weapons, it does incorporate some fresh approaches by applying hydraulics technology to improve ammunition handling and mobility.

	Selected comparisons		
	M198 (US)	FH70 (UK,FRG,IT)	FH77 (Sweden)
Weight (metric tons)	7.0	8.8	11.0
Length (meters)	11.0	12.4	10.8
Crew size	11	8	6
Rate of fire — Burst:	4 rds per min	3 rds in 15-20 sec	6 rds in 20-25 sec
Sustained:	As indicated by thermal warning device	2 rds per min for 1 hr	3 rds per min for 20 min
Auxiliary power	None	68-hp VW	80-hp Volvo

Experience has shown that hydraulically operated systems tend to become maintenance headaches. For this reason the attainment of reliability has been, and still is, an important goal in developing new howitzers, as well as improving existing ones. The RAM profile demonstrated by a heavy weapon, and especially one that has many automated functions, will provide information that eventually will determine its versatility and operationally suitability: How many rounds can it shoot and how far can it travel before something fails or needs to be replaced? When this happens, how long will it be out of action before it can be fixed? Can the repairs be performed by the crew or is organizational or direct support attention needed?

In addition to RAM and durability, our concern with survivability today is leading us toward highly mobile, armored self-propelled weapons that provide ballistic



**The loader, one of only six crew members, guides three projectiles to the loading table. This system permits a burst rate of fire of six rounds in 20 to 25 seconds.**

protection for the crew and system. Our current hydraulics technology efforts are primarily being directed toward a compressive fluid recoil system and automatic loading for armored self-propelled howitzers.

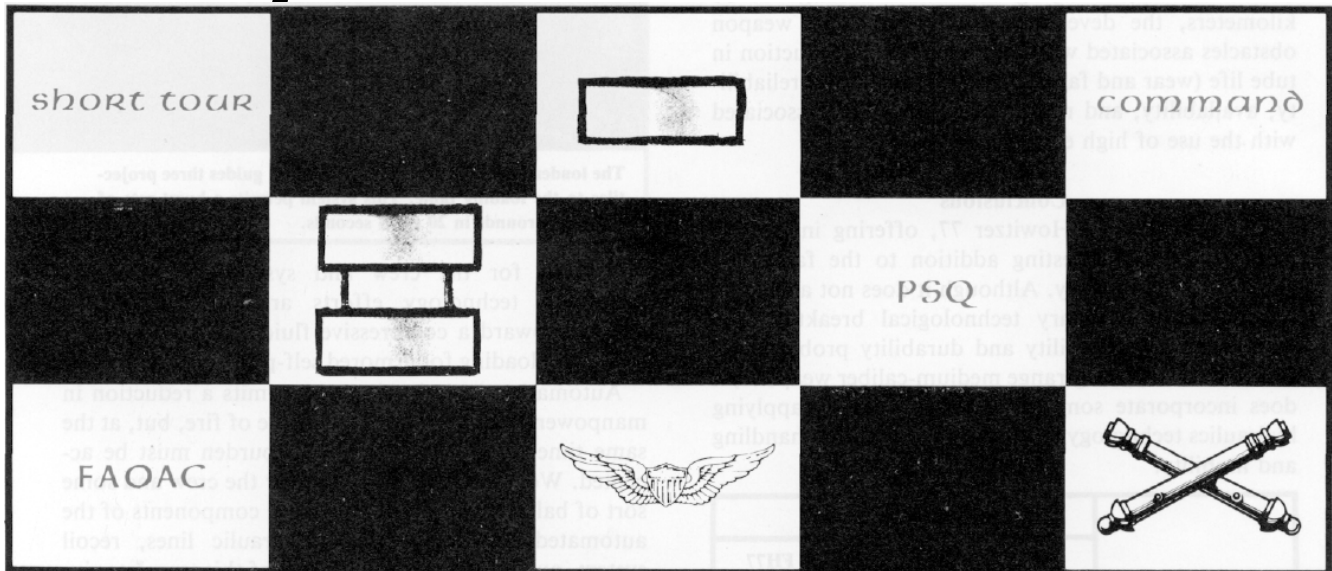
Automation is desirable as it permits a reduction in manpower and provides a higher rate of fire, but, at the same time, a higher maintenance burden must be accepted. We also want protection for the crew and some sort of ballistic cover for vulnerable components of the automated howitzer system (hydraulic lines, recoil system, auxiliary motors, etc.). All of this translates into added weight. Additionally, the system is exposed to the stress that comes with the high energy propellants needed to throw a projectile 25 or 30 kilometers. How much of an added maintenance burden will these stresses place on the components of automation? Is there enough manpower available to make the system work in the event a hydraulic or mechanical failure cannot be remedied quickly?

These are just some of the questions that the developers of any new howitzer system are faced with. The FH77 has some positive capabilities and attributes that would be desirable in any weapon system. The hydraulic method it uses is an efficient means of "pumping iron." Cased propellant has some obvious advantages over the separate propellant bags of our 155-mm systems. Also, the ammunition handling at the howitzer contributes to the high burst rate of fire.

The unanswered question the FH77 leaves us with is: "How reliable is it going to be and how survivable will the system and crew be against a strong armored/mechanized threat?" It may prove to be a good illustration of a system that provides up-to-date technological advances and handling ease; yet its operational utility remains doubtful when it has to perform for a length of time in a high stress environment.

**MAJ William Whelihan is assigned to the Cannon TRADOC System Manager's office, USAFAS.**

# career patterns



## for field artillery company grade officers

by LTC Leslie E. Beavers and MAJ Glen D. Skirvin

*These are the personal views of the Chief of the Field Artillery Branch, Company Grade Combat Arms Division, MILPERCEN, and the Captains' Career Manager. — Ed.*

The career patterns for company grade Field Artillery officers are changing — for the good of the Army, the units in the field, and the officer corps. But, each officer must be cognizant of the impact of these changes on his career, particularly with respect to timing, and must plan accordingly in light of his personal and professional goals.

In the November-December 1978 *Field Artillery Journal*, an item in the "Redleg Newsletter" addressed the current "shortage" of FA captains. This officer shortage is now being experienced in units worldwide and has a dramatic impact on career planning for our company grade Field Artillerymen.

Much publicity has been given to this officer shortfall in recent months. *Army Times*, *FA Journal*, *FOCUS* articles, and MILPERCEN briefing teams have delineated the problem and its causes. This article will discuss the significant impact of this shortfall on career management of our company grade FA officers. The



magnitude of the specialty 13 shortage is roughly 600 FA captains to meet a worldwide need of 2,450.

The major impact over the next several years will be in our professional development objectives for company grade officers. FA Branch manages company grade officers for about 10 years — from an officer's entry on active duty until his selection to O4; then his file is transferred to the Majors' Division. During this first decade of an officer's career, assignments are made to qualify him in his primary specialty (13), identify an alternate specialty in his eighth year of commissioned service, and provide assignment opportunities to start alternate specialty development. The key element of this broad development program is meeting the professional development objectives or Primary Specialty Qualification (PSQ) of the Field Artillery Specialty. Officers must have completed the following objectives before they can be considered fully qualified as Field Artillerymen:

- At least three years in a variety of jobs at artillery battalion, battery, or detachment level.
- The Field Artillery Officer Advanced Course (FAOAC).
- Command of a battery, detachment, or training company for at least one year.

These objectives have been and will continue to be our bare minimum requirements for primary specialty development. Where the captain shortage impacts on professional development is in the timing of these events and the more realistic average time an officer can expect in his primary specialty. Currently, FA company grade officers can reasonably expect an average of eight to nine years in primary specialty assignment. Since we have more than 620 battery level command positions worldwide, multiple battery command tours will be common. In fact, FA officers have averaged about 21 months command time in their company grade years. Because of the captain shortage, average command time will probably stretch out to 24 months or longer for our shortage year groups. This means an officer cannot rest on his laurels after one 12-month command tour; rather, to be competitive with his contemporaries, he should seek further command opportunities in future assignments. Many company grade officers will command as lieutenants before they attend FAOAC. This is a recent trend and is expected to continue over the next few years. FAOAC was designed to train the junior captain for battery command and battalion staff duties. Our earlier career pattern assigned the lieutenant to troop duty after the basic course to hone his leadership skills, then placed him in the advanced course as he made captain, and sent him to an assignment offering command opportunities after his graduation. With captains in short supply, the local

commander is faced with assigning lieutenants as battery commanders and senior staff officers before they attend FAOAC. It is expected that, in the next two years, most officers attending FAOAC will have completed a command tour. Currently about 20 to 30 percent of the students have commanded before FAOAC, and future classes may see a 50 to 60 percent student population command qualified.

The timing of FAOAC attendance is also being affected by the captain shortage. Heretofore, we tried to get officers into FAOAC, at the four- to five-year service mark — around their promotion point to captain. A greater variance is now being experienced, ranging from three and a half to eight years in service. The reason is twofold: first, because of the captain shortage, senior lieutenants and junior captains are being command stabilized at their normal attendance time, delaying FAOAC attendance; and, secondly, the demands for CONUS officers to be assigned overseas as senior lieutenants and junior captains necessitate their attendance after an overseas tour. Officers are now scheduled for the next available FAOAC following their completion of a 36-month tour in CONUS or completion of the required overseas tour.

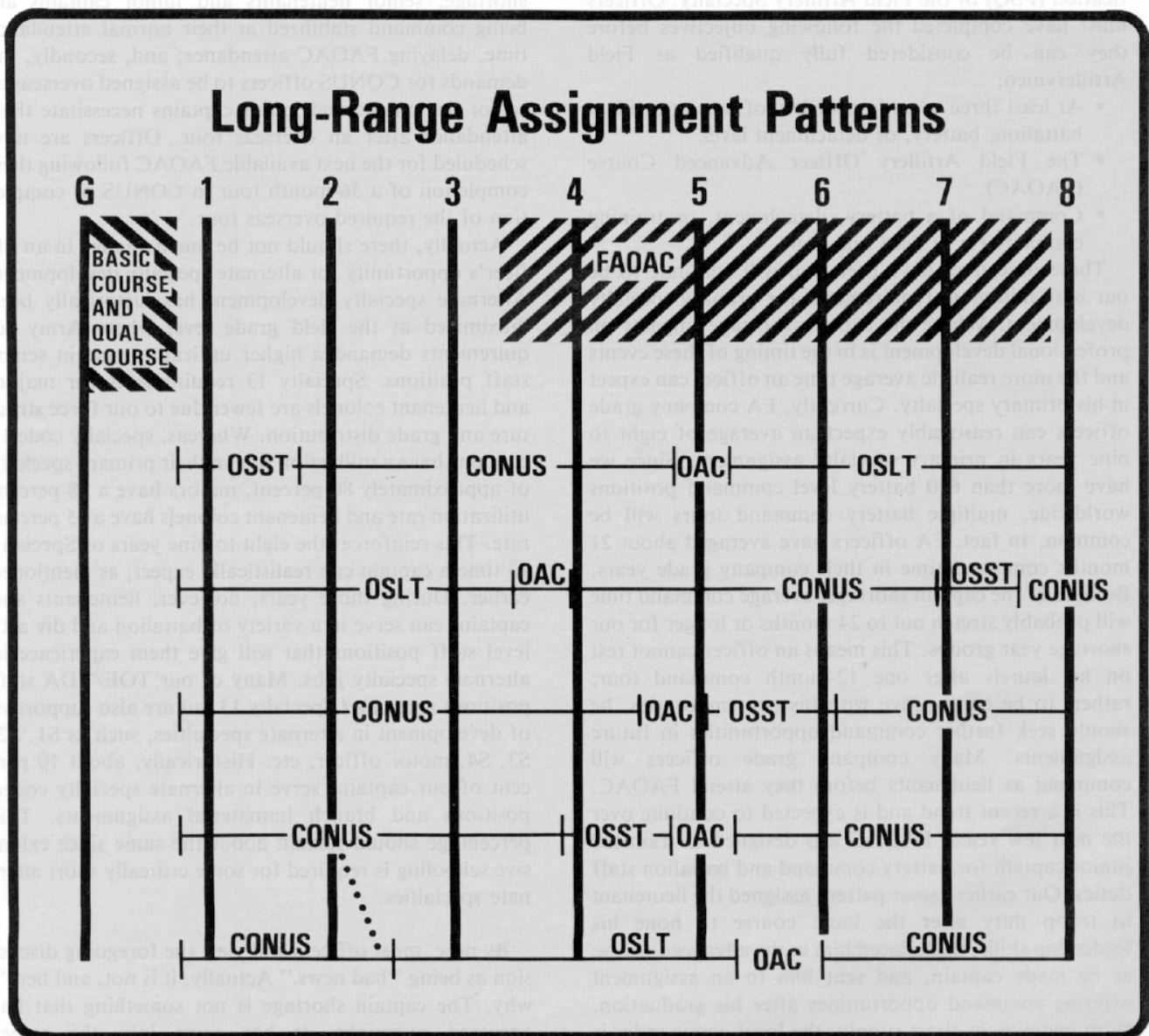
Actually, there should not be much change in an officer's opportunity for alternate specialty development. Alternate specialty development has historically been maximized at the field grade level where Army requirements demand a higher utilization rate in senior staff positions. Specialty 13 requirements for majors and lieutenant colonels are fewer due to our force structure and grade distribution. Whereas, specialty code 13 captains have a utilization rate in their primary specialty of approximately 80 percent, majors have a 58 percent utilization rate and lieutenant colonels have a 45 percent rate. This reinforces the eight to nine years of Specialty 13 time a captain can realistically expect, as mentioned earlier. During those years, however, lieutenants and captains can serve in a variety of battalion and div arty level staff positions that will give them experience in alternate specialty jobs. Many of our TOE/TDA staff positions are *coded* Specialty 13 but are also supportive of development in alternate specialties, such as S1, S2, S3, S4, motor officer, etc. Historically, about 10 percent of our captains serve in alternate specialty coded positions and branch immaterial assignments. This percentage should remain about the same since extensive schooling is required for some critically short alternate specialties.

By now, most officers will view the foregoing discussion as being "bad news." Actually, it is not, and here's why. The captain shortage is not something that has occurred overnight. It has crept into the career

management area of concern incrementally as the overstrength Vietnam year groups have gone through the 04 selection boards. The last several 04 promotion boards have demonstrated an awareness of the shortage problem vis-a-vis selection rates for Field Artillery and other shortage specialties. Those selection rates are gradually increasing and, for understrength year groups, selection rates will probably be very encouraging. Increased promotion opportunities and the fact that junior officers will be serving in positions of increased responsibility earlier in their careers will mean a more experienced officer corps. In combat arms, our goal is to lead men. Because of our current shortage, that

leadership will be more fully developed in the years to come.

Our challenge in FA branch is to manage individual professional development in line with the worldwide Army requirements. Company grade assignment patterns have not changed much with the captain shortage. We still have officers going to CONUS units and overseas. However, recent national policies of reinforcing the NATO force structure in Europe have created additional requirements for FA officers there. Approximately one-third of our company grade officers are in overseas areas with FA having the largest population of any specialty in Europe (1,500 captains



and lieutenants). Since these officers rotate after a 36-month tour, our overseas assignment policies and CONUS stability guidelines are affected dramatically. The Army's assignment priorities are reviewed by the Vice Chief of Staff semiannually and serve as the basis for allocating officers worldwide. The current priorities are:


- Priority 1 — USMA, ROTC, Army Readiness Regions, and USA Recruiting Command.
- Priority 2 — Joint and special activities.
- Priority 3 — Rest of the Army according to the DA Master Priority List.

Within priority 3, the forward deployed forces (overseas) have the highest priority. As a consequence, assignment patterns and stability are driven by the overseas, priority 1, and priority 2 requirements. Since CONUS units have a relatively low priority, they are the sustaining base for the overseas units. To be fair to all company grade Field Artillerymen, we make a point of equitably distributing overseas tours so that each officer is considered for an overseas long tour (accompanied) and a short tour (unaccompanied) during his company grade years. As the Korean redeployment transpires, we expect less overseas short tour requirements with possible tour equity shifting to two overseas long tours.

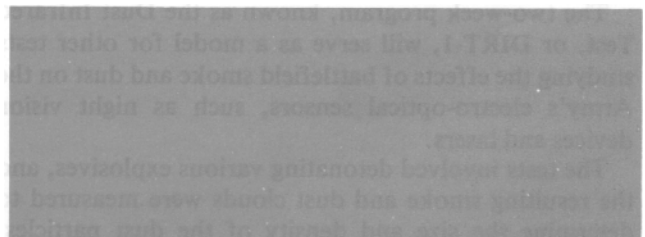
With the advent of the company grade shortage, time on station in CONUS for Field Artillerymen has moved from approximately 36 months to the present 24 months average. This is comparable to Air Defense Artillery's experience in manning their overseas units. FA Branch has consistently advised commanders and individual officers to recognize this stabilization average in their local plans for officer development. As the shortage worsens, CONUS officers nearing their 24th month on-station become increasingly vulnerable for an overseas or high priority CONUS tour. The competing demands of overseas requisitions, priority 1 assignments, and professional development goals must be balanced not only by FA Branch, but by commanders and officers in the field. We must all work together to insure that the Army requirements are met with adequate consideration for the individual's personal and professional needs.

Overseas tours must be spread equitably; therefore, we continually review those officers in CONUS approaching two years on station for potential assignments. The advent of more frequent advanced courses (four per fiscal year) may mean an increase in time on-station for the senior captains. Although it is too early to predict the total effect, we see future classes composed of about 50 percent overseas-vulnerable officers meeting most of the overseas requirement. This may tend to increase

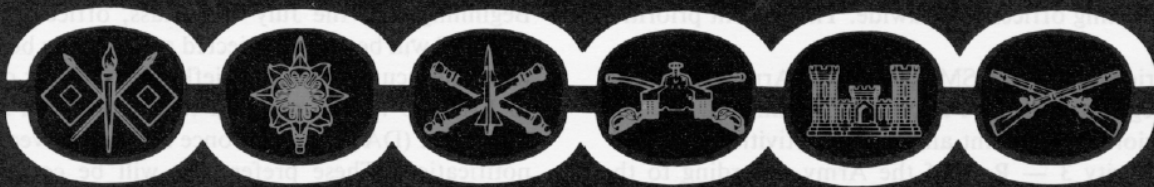
CONUS stability for the senior captains in the shortage year groups. To reach this goal, it is necessary that FAOAC class quotas be filled with a constant ratio of overseas and CONUS available officers. Once orders are received to attend FAOAC, few deferments will be granted. All requests will be examined on a case-by-case basis in light of compassionate, hardship, or operational reasons. Beginning with the July 1979 class, officers attending FAOAC will be given projected assignments before they leave their current units. Briefly, each officer on orders to FAOAC will be required to complete a Preference Statement (DA Form 483) once he has received his alert notification. These preferences will be considered in projecting his assignments against the Army requirements at graduation. Our goal is to notify the officer at least 90 days in advance of his school report date of his next assignment by major command and duty specialty; e.g., Germany, specialty 13. This will afford the officer information he needs in personal and professional planning. But, to be successful, the program requires that each officer complete a preference statement as soon as possible.

The company grade shortage will cause manning problems in the units. To lessen this problem, it is imperative that the commanders, individual officers, and career managers communicate with each other. Officers are assigned to major commands and installations based on requisitions validated according to the officer distribution plan. Commanders then suballocate officers, based on local priorities and the professional development needs of the individual. Individual officers must state their assignment development desires to local commanders and to their career manager in FA Branch. With these three parts of the triangle (FA Branch-commander-individual) working together, our mission to meet Army requirements with a professionally developed officer corps will be successfully accomplished. 

**LTC Leslie E. Beavers is Chief of the Field Artillery Branch, Company Grade Combat Arms Division, MILPERCEN, and MAJ Glen D. Skirvin is the company grade overseas monitor in the FA Branch.**



*with our comrades in arms*



## Ammo manufacture streamlined

A new loading process that melts explosive material so that it can be poured into projectiles has been developed by the Army Armament Research and Development Command. The automated melting process is safer, cheaper, and faster than the present "batch" method of loading used to fill medium and large caliber projectiles with TNT-based explosives.

The pilot facility for the new process is scheduled for completion at the Lone Star Army Ammunition Plant, TX, in late 1979. The process is expected to reduce projectile and labor costs about one-third and increase production capability about 25 percent over the present method.

The heart of the process is a pump which transfers molten explosive at more than 11,000 pounds-an hour.

## Battlefield smoke, dust studied

More than 148 rounds of 155-mm artillery and three tons of TNT were exploded in a unique series of tests at White Sands Missile Range recently.

The two-week program, known as the Dust Infrared Test, or DIRT-1, will serve as a model for other tests studying the effects of battlefield smoke and dust on the Army's electro-optical sensors, such as night vision devices and lasers.

The tests involved detonating various explosives, and the resulting smoke and dust clouds were measured to determine the size and density of the dust particles. Various types of electro-optical ground and airborne sensors were tested to see how they were affected by the smoke and dust.

## Lance contract awarded

Vought Corporation has been awarded a \$24.9 million contract by the Army for the production of Lance missiles and associated hardware. In addition to the US Army, Lance has been purchased by the armed forces of Belgium, Great Britain, Israel, Italy, The Netherlands, and West Germany.

## Nerve agents to be produced

The Copley News Service quotes a Defense Department memorandum which, according to the news service, directs the Army to "program funds in fiscal year 1980 for a binary chemical weapons production facility." The two lead items in the Army binary research and development effort are the GB projectile for the 155-mm howitzer and an 8-inch VX shell.

Binary weapons are designed with two relatively harmless chemical components which are mixed during the projectile flight to the target to produce the lethal agents. Binaries offer significant operational and safety advantages over the old weapons because they can be shipped and stored in a fail-safe mode.

General Alexander Haig, Supreme Allied Commander in Europe has warned that the Soviet Union has greatly expanded its stocks of chemical rounds for field guns, the BM-21 multiple rocket launcher, and its Frog and Scud missiles.

The news service quotes Defense Secretary Harold Brown on the US-USSR chemical warfare capabilities as saying: "I think...this is one area where there is no argument that we are far, far behind."

## South Korean missile tested

South Korea successfully tested its first surface-to-surface missiles in September at a secret site according to the *Los Angeles Times*. The missiles, developed entirely by South Korean technology, will go into production soon. No details on range or other capabilities were released. Until now, South Korean forces have relied on US-built Honest John missiles.

## Foreign military sales updated

The September issue of *Defense & Foreign Affairs Digest* reports the latest data on foreign military sales of US field artillery materiel. The Republic of China has ordered 100 M109A2 155-mm howitzers and 25 M110A1 8-inch howitzers for a total of \$92,000,000. Iran has placed an order for 84 8-inch self-propelled weapons and 214 155-mm self-propelled weapons at a total cost of \$192,000,000. The Israeli military has ordered 48,000 rounds of 175-mm high explosive with a price tag of \$14,200,000. Spain is buying 18 155-mm howitzers costing \$11,400,000. The Republic of Korea has ordered 37 M109A2 howitzers at \$24,000,000 and 22 new mortar locating radars (AN/TPQ-36) at a cost of \$54,900,000.

The same issue lists current prices for our most modern weapons as:

M109A1--\$470,000 to \$560,000

M110A2--\$523,000

M198--\$305,000

## New sling assemblies

Two new external airlift slings have been introduced into the Army inventory. One of the sling assemblies has a lift capacity of 10,000 pounds and the other a capacity of 25,000 pounds. These slings replaced the 15,000-pound capacity nylon and chain multileg sling that had been used for external helicopter airlift of supplies and equipment.

The new sling sets increase reliability, are safer to use, and reduce hookup time. They also reduce bouncing, load vibration, and the number of small hardware items needed.

CTA 50-955 provides the basis of issue for units to obtain the new slings.

## Preferred training site selected by Army

The Army has selected Fort Irwin, CA, as the preferred site for a National Military Training Center where a total combat environment can be simulated.

The site would provide realistic maneuver areas to meet the requirements of the modern battlefield, warfare techniques, and future weapons developments. If approved by the Defense Department, the site would be used by the Army's combat battalions, 42 of which would rotate through the National Training Center for two-week training sessions each year.

## First seagoing females weigh anchor

The first 15 women officers picked for sea duty reported aboard ships on 1 November and the first contingent of enlisted women became crew members of noncombat ships in December, according to a recent Navy announcement.

A total of 21 ships in the Atlantic and Pacific fleets have been chosen to receive the first 55 women officers and 375 enlisted sailors this fiscal year. The ships include various kinds of tenders, repair ships, and surveying vessels.

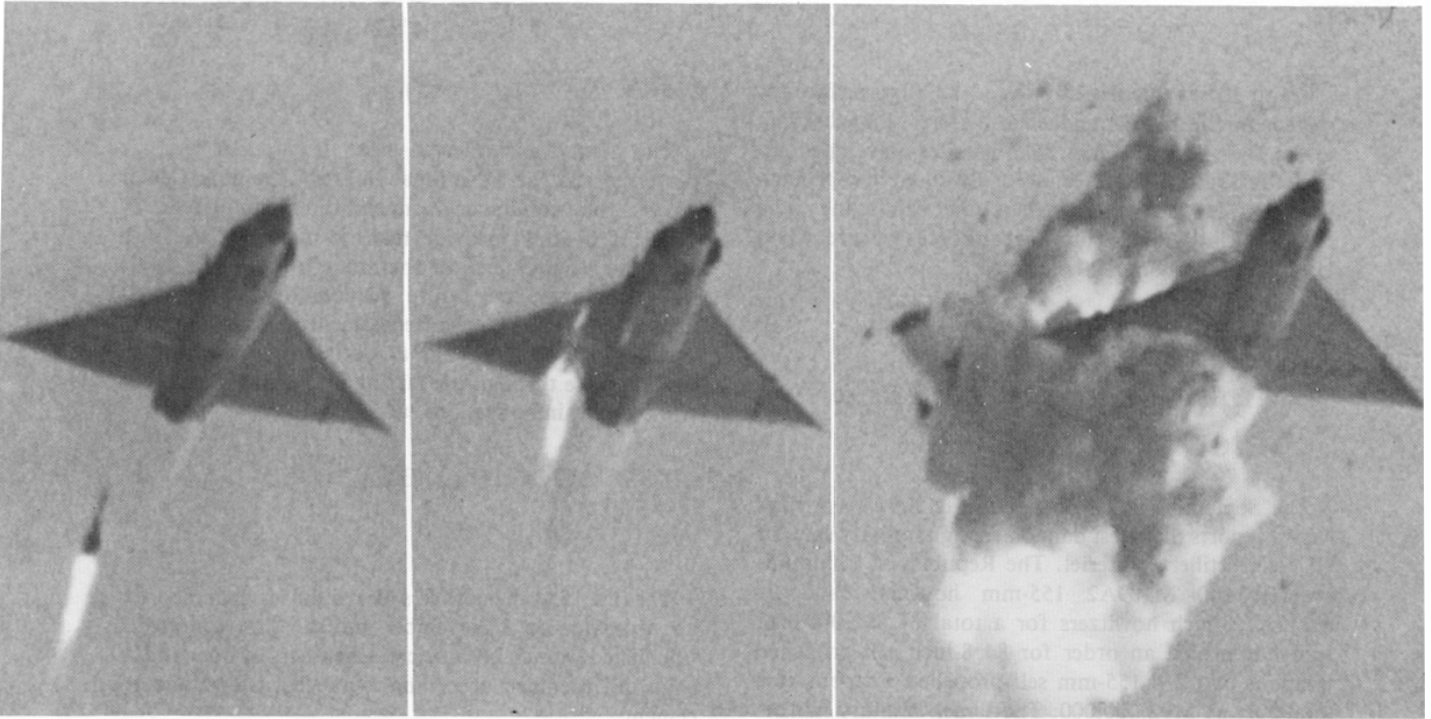
The law permits women to be assigned on combat vessels only on a temporary basis and only if the ships are not headed for actual battle.

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**Ensign Linda Day of Gallipolis, OH, reports for duty aboard the submarine tender USS L. Y. Spear, as one of the first group of women officers to serve aboard Navy ships. (US Navy photograph)**



## With Our Comrades In Arms



Although the missile was unarmed, this direct hit by Roland completely destroys an unmanned F-102 during recent tests at White Sands Missile Range.

### US Roland tests on target

US Roland, the Army's new foreign-developed but American-built air defense system, has successfully passed the most critical portions of the joint European-US test program.

Extensive contractor and government tests were conducted, demonstrating that US Roland meets Army requirements and is compatible with European hardware. The Roland achieved excellent missile reliability

in flight tests at White Sands Missile Range, and no major problems were encountered in road tests at Aberdeen Proving Ground, according to BG Joseph O. Lax Jr., US Roland project manager.

The Roland successfully engaged evasive targets at altitudes ranging from 200 to 9,000 feet, and, in one test, a single fire unit engaged two targets only seconds apart. Roland can operate day or night in all weather. White Sands tests included firings when the gunner could not see the target, relying on radar for tracking. Two other firings were made in light rain.

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### Recommended reading

COL William L. Hauser, fresh from commanding a division artillery in Europe, writes in the September 1978 issue of *Parameters* that the Army needs a General Staff System to produce the specialized leadership required to deal with the difficult problems of the Army. Hauser's plan would create a new branch within the Army for repetitive assignments, rather than the current system of officers periodically putting on the "brass" when random general staff assignments occur.

In the same issue are articles on the Soviet view of NATO and the special importance of battalion command.

### Marine Corps Commandant to Joint Chiefs

The Commandant of the Marine Corps, General Louis Wilson, has been named a member of the Joint Chiefs of Staff. The appointment of the Marine Corps Commandant to the JCS was authorized by Congress in the 1979 Defense money bill.

The commandant of the 191,000 member Marine Corps has had equal status with the Joint Chiefs on matters directly concerning the Corps since 1952, but had no say on other military affairs until now.

# REFORGER-- Golden Thunder I



by LTC Harold V. Floody Jr.

(Photos by SSG Ron Hatcher)

An M109A1 howitzer with an airtight muzzle cover is guided away from a POMCUS storage warehouse.

**"We're going!"**

**"Four days 'til we go?"**

**"I hear the wine and beer are the best."**

**"Is it cold there in September?"**

Predeployment	15 July - 8 September 1978
Deployment	8 - 13 September
Preparation for Employment	13 - 16 September
Employment	17 - 21 September
Preparation for Redeployment	22 - 28 September
Redeployment	29 - 30 September

### **Predeployment**

These were typical of the reaction of the soldiers of the 2d Battalion, 37th Field Artillery, based at Fort Sill when they received notification of their imminent deployment to Germany. The Battalion had been selected to participate in the Army's first REFORGER-related Emergency Deployment Readiness Exercise (EDRE). The exercise began 8 September 1978 and terminated 1 October 1978. The scenario the Battalion followed for the exercise was:

A Forces Command Letter of Instruction (LOI), dated 14 July 1978, indicated that an armor, artillery, or mechanized infantry battalion would be selected to participate in a no-notice EDRE. Shortly thereafter, the 2d Battalion, 37th Field Artillery, was selected as the battalion designee for III Corps Artillery, should an artillery battalion be picked. In preparation for possible deployment, the Battalion immediately began reviewing

and updating its EDRE plans and files. Several major problem areas quickly surfaced which took several weeks to resolve:

- Missing/misfiled medical and dental records.
- Nonavailability of US Army, Europe (USAREUR) drivers' training and testing material.
- Nonavailability of REFORGER training material in other areas (maneuver damage, Status of Forces Agreements, 1-kilometer zone, Soviet military liaison mission, etc.).

During the predeployment period, the Battalion published 20 REFORGER letters of instruction and conducted intensive training in many areas. A major effort was required to qualify more than 300 drivers and assistant drivers for USAREUR drivers' licenses. Training culminated with an EDRE given by the Fort Sill staff 15 through 17 August. The EDRE was based on the REFORGER scenario, and virtually every aspect of a deployment, short of actual lift-off, was executed. Very few simulations were made during the exercise. As part of the exercise, the Battalion requested and received approximately 170 personnel to bring the Battalion to full strength. The soldiers were provided by 14 battalions and 3 separate batteries at Fort Sill. Temporary billets were made available to house many of the soldiers. Also, the Battalion was issued more than 500 footlockers which were to be used, along with duffel bags, to carry the soldiers' uniforms and field equipment. A briefing for more than 100 dependents and sponsors was held, and the services of the Army Emergency Relief, Red Cross, Army Community Service, hospital, and chaplain were explained. A "wife help line" was also established to facilitate transportation, to inform and console, and to obtain health and dental care for dependents during their sponsors' absence.

### Deployment

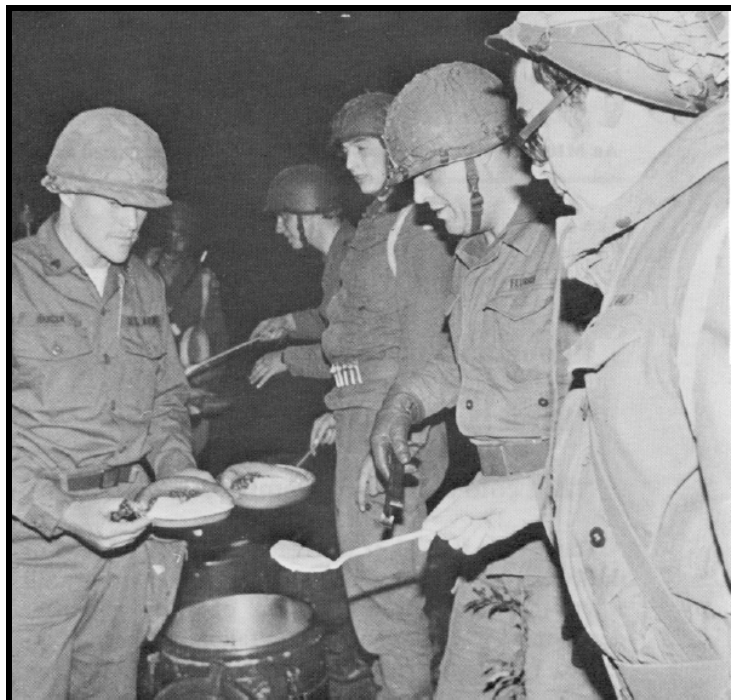
Notification for deployment was received by the Battalion at 1230 hours, Friday, 8 September. This was approximately 48 hours prior to the anticipated notification period published in the 14 July LOI. The Battalion was directed to have "wheels up" on the first aircraft 96 hours after notification. Exercise Golden Thunder I had begun. Preparation for overseas replacement (POR) processing began almost immediately and continued until 0200 hours the following day. The early initiation of POR processing was deemed essential because of the time-consuming tasks associated with it; i.e., dental and physical examination, processing of wills and powers of attorney, and pay option changes. Over 540 personnel were POR-processed during this period. Many additional

tasks were also accomplished during the next several days, to include manifesting, briefings, weapons qualification, and drawing of additional equipment.

An eight-man liaison party departed Fort Sill at 0700 hours, Sunday, 10 September. The mission of this group was to establish contact with members of the 21st Support Command and V Corps staffs and with personnel of the 6th Combat Equipment Company, from which the Battalion's Prepositioned Overseas Material Configured to Unit Sets (POMCUS) equipment would be drawn. The first flight, carrying the main body (303 personnel), a commercial DC-10 aircraft, departed Altus Air Force Base (approximately 50 miles from Fort Sill) at 1700 hours 12 September. The second aircraft, a commercial DC-8, departed Altus at 1800 hours that same day and carried the remainder of the Battalion personnel. Two military C-141s departed that day transporting accompanying troops and supplies not authorized for prepositioning.

### Preparation for employment

The batteries arrived at Frankfurt's Rhein-Main Airport just after daybreak on 13 September. Personnel were met by a reception group from the 21st Replacement Detachment and, during the next two



**Soldier of the 2d Bn, 37th FA, being served "wurst" by soldiers of the 345th German Panzer Artillery. The two battalions worked together during Exercise Certain Shield.**



hours, underwent a customs inspection, Deutschmark conversions, and verification of personal data forms. The Battalion was then bussed to Miesau Army Depot, approximately 85 miles from Frankfurt, where the Battalion's POMCUS equipment would be drawn. More than 100 Battalion soldiers (drivers, mechanics, fuel handlers, etc.), previously selected because of their skills, began to draw equipment at 1300 hours on 13 September. The sequence of draw, which was dictated by the storage configuration in the warehouse, was first the recovery vehicles, then howitzers, followed by wheeled vehicles. Other equipment, such as engineer mechanical and nonmechanical equipment and crew-served weapons, were drawn from other warehouses at the depot. Six hours later, the Battalion had drawn essentially a full complement of TOE equipment.

The next two days the Battalion lived in a tent city in an Initial Unit Assembly Area (IUAA) in Landstuhl, about five miles from Miesau. During this period, equipment was inventoried and issued to each battery, and vehicles were loaded in preparation for participation in Exercise Certain Shield, a part of REFORGER 78. Equipment shortages were reconciled with depot personnel.

On 14 September, one battery uploaded its basic load of ammunition. The removal of ammunition from ammunition bunkers at Miesau Army Depot took less than three hours. Transloading and combat configuring on the howitzers and ammunition carriers took an additional two hours. Due to the specified constraints on the upload, all this was accomplished without using any mechanical handling equipment.

### **Employment**

The Battalion departed the IUAA on Saturday, 17 September, en route to a Major Unit Assembly Area (MUAA) approximately 135 miles from Landstuhl in the vicinity of Friedberg. Tracked vehicles were shipped by rail, and wheeled vehicles were dispatched in two convoy serials. The Battalion closed in the MUAA late the same afternoon. En route to the MUAA, the Battalion came under the operational control of V Corps. The Battalion remained in the MUAA for one day and continued organization and preparation for combat.

The field training exercise (FTX) began on 19 September with the Battalion moving from the Friedberg area to an initial deployment position in the vicinity of Homberg. The Battalion was attached to the 42d Field Artillery Group and given a mission of general support-reinforcing (GSR) the 2d Battalion, 6th Field Artillery, with an on-order mission of GSR, 345th German Panzer Artillery Battalion. The initial mission was executed during the first 36 hours of the FTX and the on-order



**Thumbs up! Soldiers of the 2d Bn, 37th FA, embark on the long journey home from Europe.**

mission was assumed during the last 36 hours of the operation.

During the FTX, the Battalion moved six times over a distance of approximately 70 miles. Total mileage for the Battalion's wheeled vehicles was more than 50,000 miles and for tracked vehicles was nearly 10,000 miles. Daily resupply of rations and fuel took place at night to minimize exposure of unit locations. The FTX ended late at night on 21 September.

### **Preparation for redeployment**

On 22 September, the Battalion traveled by road to Wiesbaden Air Force Base, remaining there until the morning of 26 September. During this period, the Battalion cleaned equipment; inventoried components of all sets, kits, and outfits; and consolidated equipment by commodity in preparation for equipment turn-in.

The Battalion soldiers also had the opportunity to go sightseeing and take several tours, to include the Rhine River and Amsterdam.


After a road march for wheeled vehicles and rail movement for tracked vehicles from Wiesbaden to Miesau on 26 September, the Battalion began its turn-in of equipment. All vehicles were serviced (lubricated and oil and filters changed) by battalion personnel and then inspected. Deficiencies and shortcomings were corrected, parts applied if necessary, and equipment was then turned in. Reconciliation of hand receipts was accomplished on 28 September, and a clearance certificate was issued to the Battalion the following day. During this period, Battalion personnel lived in a tent city approximately 15 miles from Miesau.

### **Redeployment**

Battalion personnel departed for CONUS from Ram-stein Air Force Base on two flights. Upon arrival at Altus Air Force Base on 29 and 30 September, the Battalion was greeted by the III Corps Artillery Commander and the 212th Field Artillery Group Commander, the headquarters to which the Battalion is assigned. Personnel were then bussed to Fort Sill, and as the busses pulled into the battalion area, they were welcomed by their dependents, the 77th Army Band,

and "Welcome Home" banners and placards of all shapes and sizes.

Wives of the soldiers had also decorated the Battalion dining facility and had baked cakes and provided refreshments for the men. The dining facility was the scene of many joyful embraces and reunions that morning. The Battalion had come home.

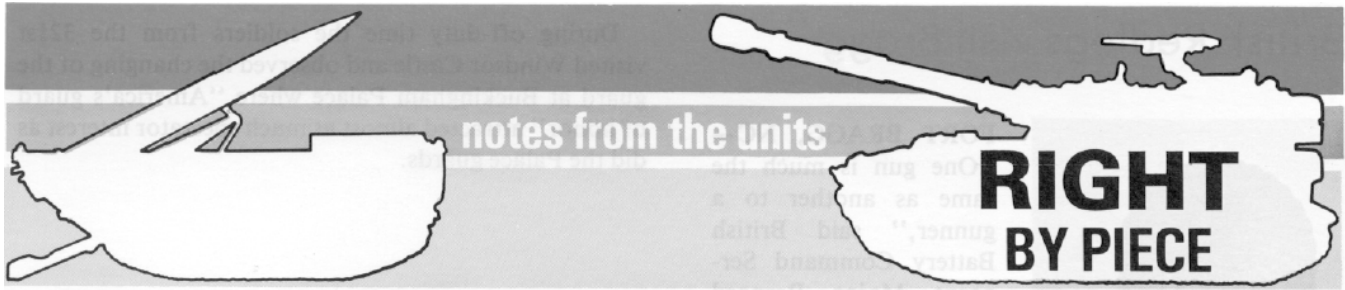
The Battalion and the Army learned a great deal from Exercise Golden Thunder I. Problem areas in the entire sequence, from predeployment through redeployment, were identified. In some instances, solutions were proposed which resolved the problems on the spot. In other instances, the problems were of such consequence that more study was, and is, needed to find solutions. In the Army's drive to increase the readiness of its forces, these exercises are extremely beneficial. The "system" is put to the test, with no simulations. If a problem area is identified, or if a "better way" is found, the Army has prepared itself better for its mission of combat. 

**LTC Harold V. Floody Jr. is Commander of the 2d Battalion, 37th Field Artillery.**

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## **Saint Barbara's correction**

On page 37 of the November-December *Journal* new policies for the award of Saint Barbara medallions were described. It was reported that units could acquire *certificates only* without charge and that only the medallions and presentation folders required payment. New information reveals that certificates alone cost \$1.50 each when issued without the medallion but are included in the price of \$7.00 when a medallion is ordered. The presentation folder is \$7.00 alone or \$8.50 with a certificate.



## M198 under heavy field test

FORT BRAGG, NC—The hills are alive with the sound of cannon fire at Fort Bragg. Coleman and McPherson impact areas have reverberated from the steady onslaught of 1,800 rounds during two 72-hour firing periods.

Since mid-October, the cannoneers of A Battery, 1st Battalion, 73d Field Artillery, have been testing the new M198 howitzer—the improved 155-mm towed cannon which can outrange similar weapons of any potential enemy.

The first day of firing gave the gun crews an idea of what they were up against. During each three-day period they were required to change firing locations 11 times and fire 73 missions. Once firing was completed at the first location, crewmen attached sling load straps and prepared the howitzers to be airlifted to the next site by CH-47 helicopters.



Grass and sand swirl under the prop blast from a CH-47 helicopter as an M198 howitzer is hooked up for movement to another firing location. (Photo by SP5 Larry White)

The men who waited for the helicopters knew that this was just the beginning. At the end of October, the follow-on evaluation (FOE) test period was to begin. Three M198 howitzers were employed during this portion of the Fort Bragg test. A crew from the US Marine Corps also participated by manning one M198.

A total of 17,500 rounds were fired during the FOE, of which 3,735 were fired with maximum charge from the extreme western portion of the installation. Because of impact area limitations, firing was not done at maximum range which is 30 kilometers with the M198, or double the range of the standard M114A1 howitzer.

If the FOE is successful, the 1st Battalion, 73d Field Artillery, is scheduled to be the first Army unit to receive a full complement of M198s after they are put into full-scale production. (SP5 Don Carr)

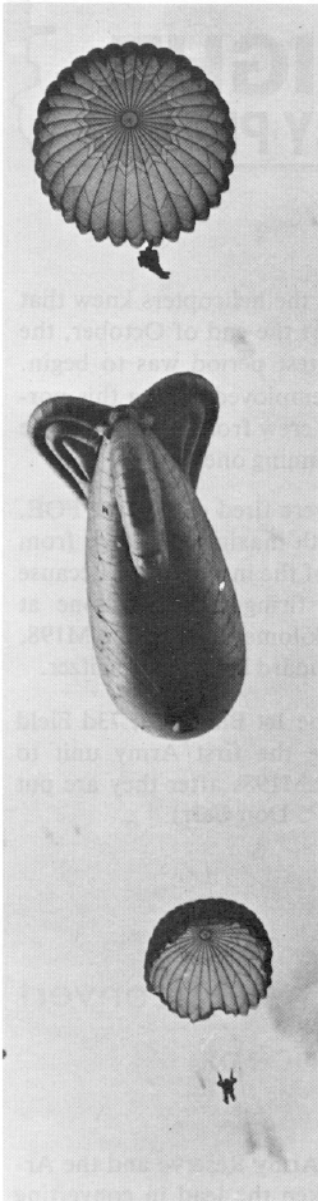
## Reserve Components convert to FA Brigade concept

WASHINGTON, DC—The Army Reserve and the Army National Guard have taken the lead in converting their Field Artillery Groups to Field Artillery Brigades. All three Reserve groups will convert on 15 January, and 19 National Guard group headquarters have reorganized. Only the Rhode Island Guard has been delayed.

Active Army FA groups have been delayed for various reasons, with only one brigade, the 17th in Germany, converted to date. The conversion from groups to brigades brings FA organizations more in line with command and control requirements of modern doctrine.

## Right By Piece

### British Redlegs visit Bragg



Parachuting from balloons is a change for Redlegs of the 82d Airborne Division who participated in three such jumps while in England on Exercise Mill Race.

FORT BRAGG, NC—"One gun is much the same as another to a gunner," said British Battery Command Sergeant Major Bernard Kelly. "The big benefit comes in our lads seeing American life and American soldiering, first hand."

The evaluation referred to the exchange program, called Stoney Run/Mill Race, between the 82d Airborne Division's Battery C, 2d Battalion (Abn), 321st Field Artillery, and British soldiers from the 97th Battery, 4th Field Regiment, Royal Artillery.

During their military training, the British soldiers participated in live fire exercises, airland operations, and parachute operations. In addition to regular training, the British soldiers were able to visit Washington, DC, the North Carolina State Fair, the Amphibious Warfare Training Center at Little Creek, VA, and the Newport News and Virginia Beach area. Sixteen of the British soldiers took sky diving training with the 82d Sport Parachute club.

The other half of the trans-Atlantic exchange involved C Battery, 2d Battalion, 321st Field Artillery, going to train with airborne artillerymen of the 29th (Corunna) Battery, Royal Artillery, at Lille Barracks, England. The US artillerymen trained on the British 105-mm towed howitzer and parachuted from balloons.

During off-duty time the soldiers from the 321st visited Windsor Castle and observed the changing of the guard at Buckingham Palace where "America's guard of honor" attracted almost as much spectator interest as did the Palace guards.

### Conservation prize to Fort Sill

FORT SILL, OK—The Secretary of Defense annual Natural Resources Conservation award for 1977 was recently presented to Fort Sill. The award is given to the US military installation which has made the greatest progress in applying natural resources conservation principles.

The Defense conservation program includes more than 19 million acres of the 25.4 million acres of land controlled by the Department of Defense. The program is also designed to encourage maximum recreational use of military property.



CAMP CASEY, KOREA — The last scheduled Honest John to be fired in the US Army roars off the launcher near Chorwon, South Korea. Honors for firing the last rocket on 12 October went to SSG James B. Spillman, B Battery, 1st Battalion, 31st Field Artillery. The Honest John has been replaced by the Lance missile. (Photo by KATUSA PFC Lee Keun)

## Mr. Airborne Artillery retires

FORT CAMPBELL,  
KY—Any

Artilleryman who has served in an airborne Field Artillery unit in the past quarter century knows COL Arthur P. Lombardi. Those who served with him regret his recent retirement after 36 years' service.

Colonel Lombardi joined the Army in World War II, made corporal within a week, made buck sergeant three months later, and, within a year, was wearing first sergeant stripes. He objected, but accepted a commission during the invasion of Luzon and fought in Korea and Vietnam as the imposing array of medals on his chest attest. During retirement ceremonies, Colonel Lombardi capped that array with the Distinguished Service Medal.

In remarks at his retirement, Lombardi said: "It is a sad occasion for me to leave the Army that I so dearly love. Through other retirement ceremonies I have heard the retiree cited for dedicated and selfless service. But it is the retiree who should be grateful. Grateful because no other profession provides the rewards that are peculiar to Army life. Grateful because there is no camaraderie the like of which is forged between soldiers."

Lombardi, whose last assignment was Deputy Post commander, said that of all his assignments, the highlight of his career was command of the 2d Battalion, 320th Field Artillery, in 1963.

Colonel Lombardi and his wife, Dee, plan to live in Port Charlotte, FL.

## Lance fired in tactical scenario

FORT SILL, OK — In its first tactical annual service practice (TASP), the 2d firing platoon of C Battery, 1st Battalion (Lance), 12th Field Artillery, successfully fired a Lance missile under simulated combat conditions at White Sands Missile Range.

The TASP is a step forward in Lance training because under the old annual service practice concept, the unit



**COL Art Lombardi.**

was evaluated in a sterile, almost administrative, environment, and performed only technical missile-related operations.

Under the new TASP concept, the unit is required to deploy from Fort Sill, occupy a field position, and conduct those operations it would in combat. The firing platoon and the assembly and transport section were flown by C-141 aircraft from Altus AFB, OK, to Holloman AFB, NM. Upon arrival, the unit occupied a field position somewhere in the desert and began "combat" operations.

During the two-day exercise the unit was evaluated on its equipment maintenance, resupply convoy, assembly and transfer of missiles, and the actual firing. Soldiers were evaluated on various individual tasks in addition to their collective tasks.

### Correction

The November-December 1978 *Journal* contained an item on two female West Point cadets training with the 3d Battalion, 79th Field Artillery. Reference was made to the unit being "cannon" which was in error as the 3-79th is a Lance battalion.

## 1st Inf Div Arty wins reenlistment honors

FORT RILEY, KS—MSG Woody Anderson, reenlistment NCO for 1st Infantry Division Artillery has been selected as the Reenlistment NCO of the Year for Fort Riley and for the 1st Infantry Division. At press time, it was announced he had won honors as the Forces Command Reenlistment NCO of the Year.

During 1978, Anderson's record-140 percent of Div Arty's reenlistment objective—was good enough to give 1st Inf Div Arty the Commanding General's Reenlistment Trophy.

When asked what the major factors were in getting a soldier to re-up, Anderson listed job security, travel, and the opportunity to go to a service school as the top reasons.

Anderson sees the challenge of meeting the needs of the Army to maintain the "middle soldier" as one of his most important jobs. "A lot of people tend to forget the middle soldier—the one with 6 to 10 years of service. Sometimes more attention is paid to the first termers," explained Anderson. "These middle people have to learn that someone, specifically the Army, does care about them."

## Right By Piece



**SP4 Janet Hill is rescued from Haleiwa Bay by a Coast Guard Search and Rescue Team as part of recent adventure training.**

## Hawaii Redlegs in adventure training

SCHOFIELD BARRACKS, HI—Headquarters Battery, 25th Infantry Division Artillery, recently underwent rigorous survival training that consisted of movement by land, sea, and air with the cooperation of the United State Air Force and the Coast Guard.

The three-day adventure training program, for E4s and below, began with an airmobile movement in UH-1H helicopters from the 25th Aviation Company, flying nap-of-the-earth into the Koolaus Mountains, the uninhabited jungle region of Hawaii. After a number of classes in basic survival techniques and an overnight bivouac in the mountains, the soldiers were divided into four groups, given a map, and a set of beginning coordinates. After completing the 10-kilometer land navigation course, the soldiers were trucked to the ocean for a bivouac on the beach. Early the next morning, the US Air Force's Life Support Section and a Coast Guard

Search and Rescue Team conducted a water survival course, consisting of raft operations, use of water survival equipment, and a practical exercise in air rescue. Members of the battery were thrown from the rafts and subsequently pulled out of the ocean by the Coast Guard.

The training was different and challenging for the men and women of Headquarters Battery who normally work as clerks, mechanics, wiremen, and surveyors.

## 3d Armored Div Arty counselor tops in V Corps

HANAU, GERMANY—"Caring for troops is what a good reenlistment program is all about," says V Corps Career Counselor of the Year, SFC John W. Biltoft. Biltoft, the 3d Armored Division Artillery Career Counselor, is in a good position to know what he is talking about—he won the Division and V Corps Career Counselor of the Year titles.

The 3d Armored Division had the best reenlistment record in V Corps for 1978 and Div Arty placed first in the Division's yearly reenlistment standings.

Biltoft has some definite ideas on what it takes to have a good reenlistment program. "Good, fundamental leadership is what it all boils down to. You have to care about your soldiers year round and not just at re-up time. We have some of the finest noncommissioned officers in the Army here in Div Arty but we can all do better," he says.

"I believe the single best way to improve reenlistments is to improve the training given to NCOs. The NCO is told to go out and take care of his troops, but, in too many cases, many young NCOs don't have enough training to effectively do the job. A really top-notch NCO should know everything there is to know about his soldiers, from their mother's maiden name to their boot size and everything in between. When you know your soldiers that well, you know when they have a problem, you know their strengths and weaknesses, and you are then better prepared to help them."

Job satisfaction is another key element in retaining soldiers according to Biltoft who says, "If you make a man feel like a success at what he is doing, he'll want to stay with the winning team."

When asked what priority reenlistment should have at the unit level, Biltoft answered, "Taking care of your men is number one priority, training and readiness are other top priorities. Reenlistment is one of those things that, if handled right, need not be on a priority list. It will take care of itself." (Tony Geishauser)

## Battery wins award three times

FORT BRAGG, N.C.—For an unprecedented third consecutive time, the 18th Field Artillery Brigade (Airborne) Honor Battery award has been won by C Battery, 1st Battalion, 73d Field Artillery. The battery's previous winning of the award was described in the September-October 1978 issue of the *Journal*.

The 155-mm towed howitzer unit took the quarterly award with a total of 856 out of a possible 1,000 points to become the first battery to win the award three times.

C Battery Commander, CPT Michael Cuff, said "We've got about 100 members in the Battery and they are all behind the program. It would be hard to say who gets the credit for winning the award. Everybody works at it. Rather than have a crash program for inspections, we just keep ourselves ready all the time."

Although the superior performance of the Battery can be attributed to the overall esprit de corps of the unit, CPT Cuff believes that the success depends largely on strong NCO leadership.



**FORT SILL, OK —** The target is pointed out to GEN George S. Blanchard, USAREUR Commander in Chief, by SSG Henry T. Warren, a fire support team chief for the 1st Battalion, 17th Field Artillery, who is using a laser range finder. GEN Blanchard visited Fort Sill recently for a series of briefings on TACFIRE and the Field Artillery School and Training Center. (Photo by Sgt J. Ruiz)

## Commanders Update

COL Joseph L. Nagel  
18th Field Artillery Brigade (Abn)

COL Ronald B. Stevens  
4th Infantry Division Artillery

COL Joseph L. Ecoppi  
5th Infantry Division Artillery

COL Bernard H. Herring  
9th Infantry Division Artillery

COL Edwin S. Olsmith Jr.  
558th Artillery Support Group

COL Leroy C. Bell  
2d Training Brigade  
Fort Jackson

COL Ernest D. Johnson  
4th Training Brigade  
Fort Knox

LTC John A. McManners  
1st Battalion, 3d Field Artillery

LTC John C. Ellerson  
1st Battalion, 13th Field Artillery

LTC John T. Thomas  
3d Battalion, 13th Field Artillery

LTC Ronan I. Ellis  
1st Battalion, 30th Field Artillery

LTC Richard W. Lind  
1st Battalion, 31st Field Artillery

LTC Robert F. Williamson  
2d Battalion, 36th Field Artillery

LTC Stanley J. Kwieciak  
2d Battalion, 78th Field Artillery

LTC James E. Tindall  
1st Battalion, 81st Field Artillery

LTC Stanley E. Whitmore  
2d Battalion, 92d Field Artillery

LTC Deral E. Willis  
1st Battalion, 319th Field Artillery

LTC William H. Mott  
512th Group

LTC Phil K. Bomersheim  
1st Cannon Training Battalion

LTC Earl T. Bowen  
2d Battalion, Troop Brigade  
Fort Benjamin Harrison

LTC Gerard A. Goodbold  
7th Battalion, 2d Training Brigade  
Fort Jackson

LTC Rudolph Ehrenberg  
8th Battalion, 2d Training Brigade  
Fort Jackson

LTC Donald L. Peters  
1st Battalion, 3d Training Brigade  
Fort Dix

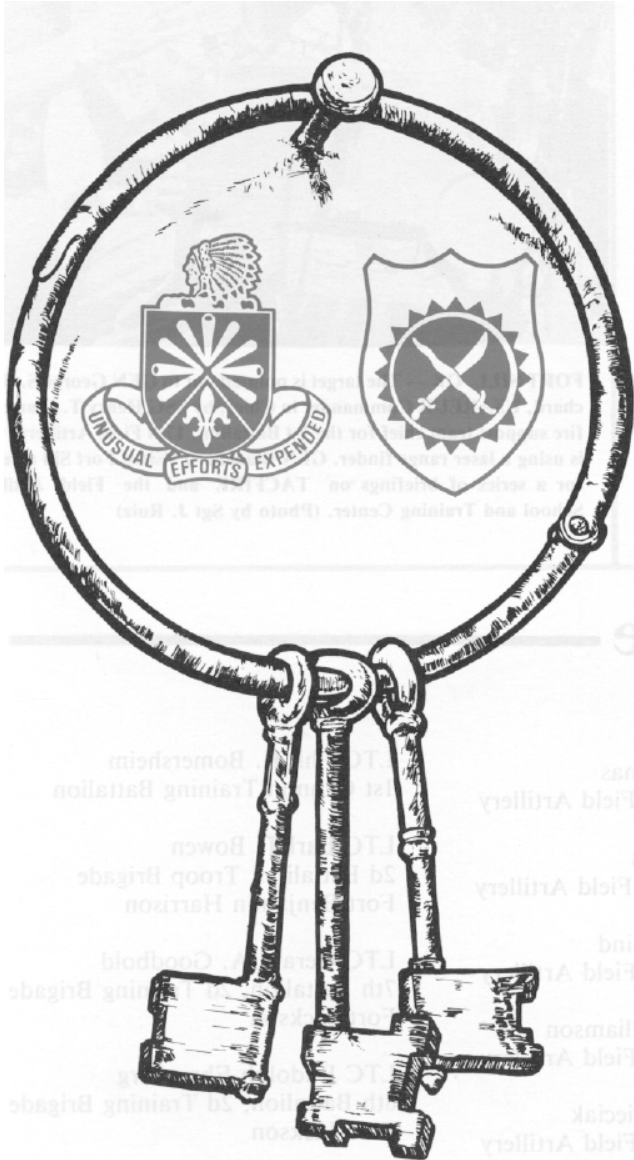
LTC Robert W. Turner  
1st Battalion, 3d Training Brigade Fort  
Leonard Wood

LTC Fred C. Dunaway  
4th Battalion, 3d Training Brigade  
Fort Leonard Wood

# Affiliation

*"I believe that a good deal can be done by making the Reserves more ready by engaging them in peacetime in activities that are more directly connected with the role of the Active forces."*

—Secretary of Defense Harold Brown



## key to improved readiness

by LTC Merrill B. Burruss

The 1st Battalion, 158th Field Artillery, Oklahoma Army National Guard (OKARNG), has just completed its third year of affiliation with III Corps Artillery, Fort Sill, OK. The relationship has produced positive results and is one of growing mutual respect. In terms of the affiliation program objective of improving Reserve readiness, it has been a resounding success. The contractual agreements of affiliation involve the III Corps Artillery Commander; Commander, US Army Readiness Region VII; and the Oklahoma Adjutant General. The functional level of affiliation rests primarily with my battalion (1-158th FA) and the Active Army host battalion (4-4th FA), currently commanded by LTC William F. Kelly. Involved to a lesser degree are our two headquarters, the 75th Field Artillery Group (for the 4-4th FA) and the 45th Field Artillery Brigade (our higher headquarters).

A prime factor enhancing affiliation success is the proximity of the units. Headquarters and service batteries of the 1-158th FA are located in Lawton; firing batteries are located in Anadarko, Chickasha, and Duncan, OK, all within 50 miles of Fort Sill. Additionally, most of the 1-158th's tracked vehicles are located at Fort Sill.

### Training — keystone of readiness

With limited annual training hours, the 1-158th plans training or training objectives as far in advance as possible. Another long-standing practice is not to ask our affiliated Active Army unit for anything (instructors, classes, or other training support) that we can provide for ourselves.

Since the advent of the Army Training and Evaluation Program (ARTEP) and decentralized training concepts, input for future training is solicited at the lowest possible level. Our battery commanders, battery training officers, and training NCOs monitor and listen to their sections for training desires and needs. The section input is combined with that of my battalion staff and discussed with the affiliated unit commander and his personnel. As ideas become plans, the 45th Brigade and the 75th FA Group are advised, and their input is requested.



This process is a continuing one that must be rigid enough to obtain the desired training results, but flexible enough to accommodate changes in regulations, personnel, and availability of ammunition and training areas. The challenge is to develop a yearly training plan and quarterly training schedules that will produce the best training possible and the highest degree of unit readiness, in the limited hours of available training time.

Calendar year 1977 began with our preparation to conduct battery-level training ARTEPs during annual training 1977 (AT 77). The ARTEPs were to be administered by III Corps Artillery with the nuclear weapons surety program to be evaluated in July by Fifth Army. Preparation for these two events occupied most available training time during the first two quarters of 1977.

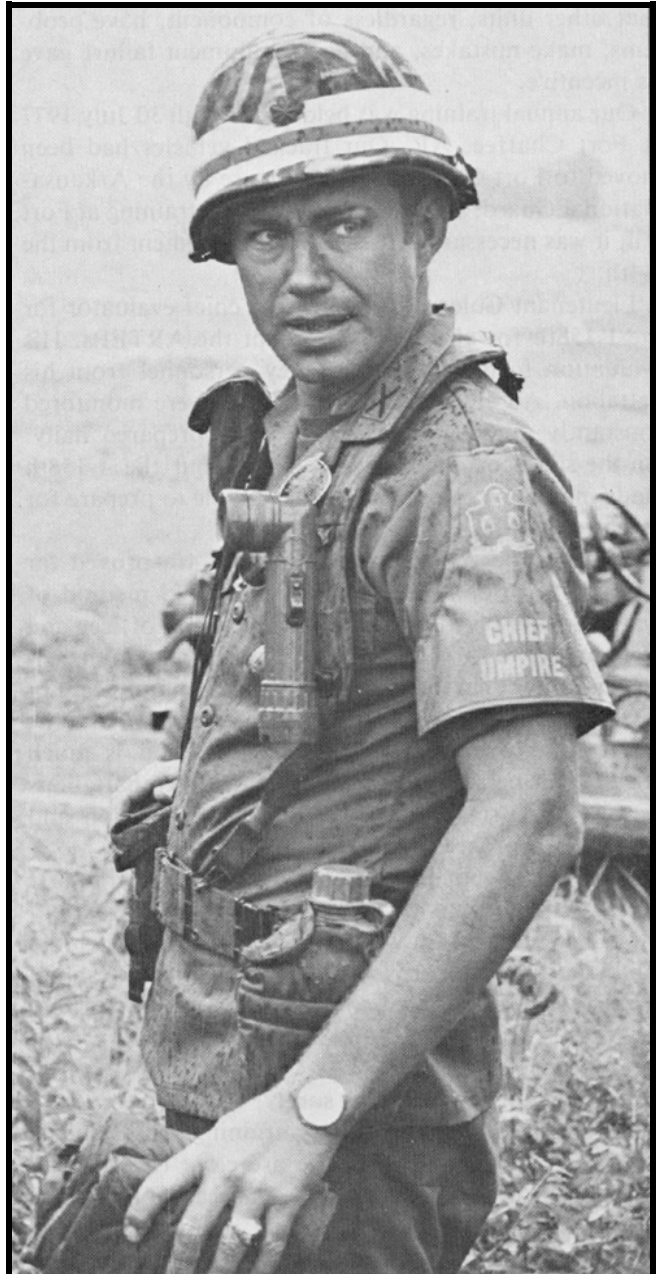
LTC William Kelly, commander of the 4-4th, made his staff, key NCOs, and equipment available as needed. This effort by the 4-4th was in addition to their own unit responsibilities, and many of these personnel gave up weekends to accommodate our weekend training schedule. Although the requirements for personnel and equipment are planned and known far in advance, the call for an additional item of equipment to replace a deadlined item often comes the day before a weekend drill. When this happened, the assets of III Corps Artillery were made available to us.

The most common, effective method of using the 4-4th on drill weekends was a one-on-one basis with their respective Guard counterpart. This procedure resulted in better communication and rapid identification of problems, as well as prompt corrections and solutions. The most frequently called on Active personnel are shown in table 1.

Table 1. Active Army positions of most help to affiliated unit.	
Battalion level	Battery level
Commander	Commander
Executive officer	Assistant executive officer
S3	Chief of firing battery
Fire direction officer	Howitzer section chiefs
Special weapons officer	Survey section chiefs
Command sergeant major	FDC chief computers

After each training period, Lieutenant Colonel Kelly consolidates the comments and suggestions of his people and discusses them with me and my staff. These sessions are also used to discuss future training plans, operations, and any support needed. In addition, battalion-prepared general information booklets are shared and compared.

We train only one weekend per month, but my unit's full-time technicians are in communication with the 4-4th weekly, if not daily.



LTC William F. Kelly and his Active Army battalion took on the added responsibility of assisting a National Guard battalion.

### The ARTEP

As the 4-4th prepared for its own ARTEP, the two battalions developed great interest and concern as to training progress, problems, and, in particular, innovations that would gain the required accuracy and speed on the ARTEP. Nineteen members of the 1-158th observed

all or part of the 4-4th's external evaluation. Affiliation funds allowed some of the Guard personnel to be paid, and some attended a portion of the ARTEP on a non-paid status. Viewing a comparable unit undergoing evaluation was very beneficial. The realization that other units, regardless of component, have problems, make mistakes, and have equipment failure gave us incentive.

Our annual training was held 16 through 30 July 1977 at Fort Chaffee, AR. Our tracked vehicles had been moved to Fort Chaffee earlier for use by the Arkansas National Guard; so, for our last live-fire training at Fort Sill, it was necessary for us to draw equipment from the 4-4th.

Lieutenant Colonel Kelly was the chief evaluator for the 1-158th for all of AT 77 except the ARTEPs. His evaluation team consisted of key personnel from his battalion. All elements of the 1-158th were monitored constantly, and detailed reports were prepared daily. On-the-spot corrections were made, and the 1-158th made maximum use of the time available to prepare for its battery ARTEPs.

This method of evaluation by the 4-4th proved far superior to prior AT evaluations. The old method of evaluation involved having one field grade officer and perhaps one to three enlisted assistants evaluate the entire battalion. Three or four individuals simply cannot cover every aspect of a battalion-size operation, and the rate of improvement during an AT period is much slower. During AT 77, the two nonaffiliated battalions of the 45th Brigade had the old-type evaluation and their rate of progress was much slower.

During the second week of AT 77, a team from III Corps Artillery moved in to administer the battery ARTEPs. The 1-158th was especially honored when the commander of III Corps Artillery arrived for the actual ARTEP. All batteries of the 1-158th received satisfactory ratings on their overall AT evaluation.

### **Nuclear surety**

Our nuclear weapons surety training was handled somewhat differently. Since we are close to Fort Sill, our nuclear weapons personnel train at Fort Sill on weekend drills that involve special weapons training. One of the special weapons NCOs in the 4-4th was especially interested in the 1-158th and visited the unit regularly on weekend drills, and the S2 made several visits. Since most of our special weapons personnel were trained in the unit without benefit of formal training, they observed only themselves in action. The 4-4th special weapons personnel, many of whom were school trained, put on a demonstration and seminar for us, which helped us overcome some inbred on-the-job training problems.



**More realistic training was one benefit of affiliation for the Oklahoma guardsmen.**

The nuclear weapons surety program of the 1-158th was evaluated by Fifth Army on a drill weekend in July 1977. We were well prepared for the inspection. The evaluator's comments were quite favorable and resulted in a letter of commendation from the Fifth Army Commander. The 4-4th was pleased to have had a part in the program and proud to have the 1-158th affiliated with their unit.

In September 1977, my battalion XO and training NCO accompanied the 4-4th to Fort Carson, CO, to participate in a one-week CPX. The guardsmen worked in the 4th's tactical operations center and played an important part in the CPX.

October marked the second annual fire competition between the 1-158th and 4-4th. The two battalions' representative sections competed, with the battalion commanders and S3s as judges. In 1977 the 4-4th was the winner on time, but each battalion had the same number of hits. The 1-158th won the competition in 1976.

## Personnel readiness

Retention and recruiting problems are not unique to the Active element. The retention of qualified people and the recruiting of interested and qualified individuals to man the Guard in our highly technical and exacting MOSs are a continuing challenge. Personnel turnover is a constant problem in obtaining security clearances, in section reorganization and training, and in maintaining small-unit readiness.

The Authorized Manning Level (AML) for the 1-158th is 488. Full TOE strength is 504. During the past year, the battalion has maintained strength at or near the AML, which is no small task. Retention and recruiting are primary concerns for our battery commanders and technicians.


My staff and I believe affiliation has been a very positive contributor to better retention and recruiting. Being aware of the 1-158th's concern about strength, the 4-4th commander initiated a program to assist. He interviews all personnel being discharged from the 4-4th and talks to them about the National Guard — the 1-158th in particular. He has also talked to the Active Army recruiters in the area, soliciting their help and cooperation in working with my battalion's recruiters. At his suggestion, we placed National Guard recruiting material at the out-processing area at Fort Sill to make the people aware of the unit.

To support recruiting, the 4-4th commander has made unusual efforts to see that all affiliated activities with the 1-158th were reported to the news media. Several articles have appeared in *The Fort Sill Cannoneer*, and affiliated activities have been reported in the regional civilian newspapers and on TV and radio stations.

Lieutenant Colonel Kelly has accompanied me on visits to each of my armories to discuss recruiting and retention with the battery commanders, full-time technicians, and unit recruiters. The close association and mutual respect that have developed between the 1-158th and its Active Army counterpart have had a positive effect on the retention of quality personnel in the unit. Not only does the guardsman have pride in, and an identity with, the 1-158th, he also has, through affiliation, an identity with the elite III Corps Artillery, the 75th FA Group, and the 4-4th FA. The 4-4th usually brings their new officers out to watch the 1-158th train and operate. They have used our equipment many times and have adopted some of our innovations.

Because it is close to Fort Sill, the 1-158th is fortunate to have numerous civil service employees as members. With their training and experience, these people make outstanding guardsmen.

Affiliation extends beyond the drills and AT, and necessarily so. During the past year, members of the 1-158th have been invited to attend III Corps Artillery ceremonies and receptions. Officers of the 4-4th FA have invited their counterparts and wives to command social functions at the Fort Sill Officers Club. The officers from the 1-158th reciprocated by inviting their 4-4th counterparts to the Oklahoma National Guard Military Ball.

According to the 4-4th commander, affiliation is a "two-way" street; not only does it help the Guard unit but it also helps the Active unit. Affiliation has resulted in two units working together, where cooperation and mutual respect have added to the readiness and professionalism of both. Isn't this what the "one Army" concept is all about? 

*The 4-4th FA and 1-158th FA attended AT 78 at Camp Shelby, MI, during July 1978. During AT 78, the 1-158th received the following written comment from the Forces Command evaluator: "This unit has achieved the highest level of performance of any Field Artillery unit in this Region (Readiness Region VII)." Rounding out the "one Army" concept during AT 78 was LTC Robert Allen, USAR, a member of the Individual Ready Reserve, who "counterparted" with an Active Army battalion commander for annual Active duty training. Lieutenant Colonel Allen accompanied the 4-4th FA and the 1-158th FA, OKARNG, to AT 78. — Ed.*

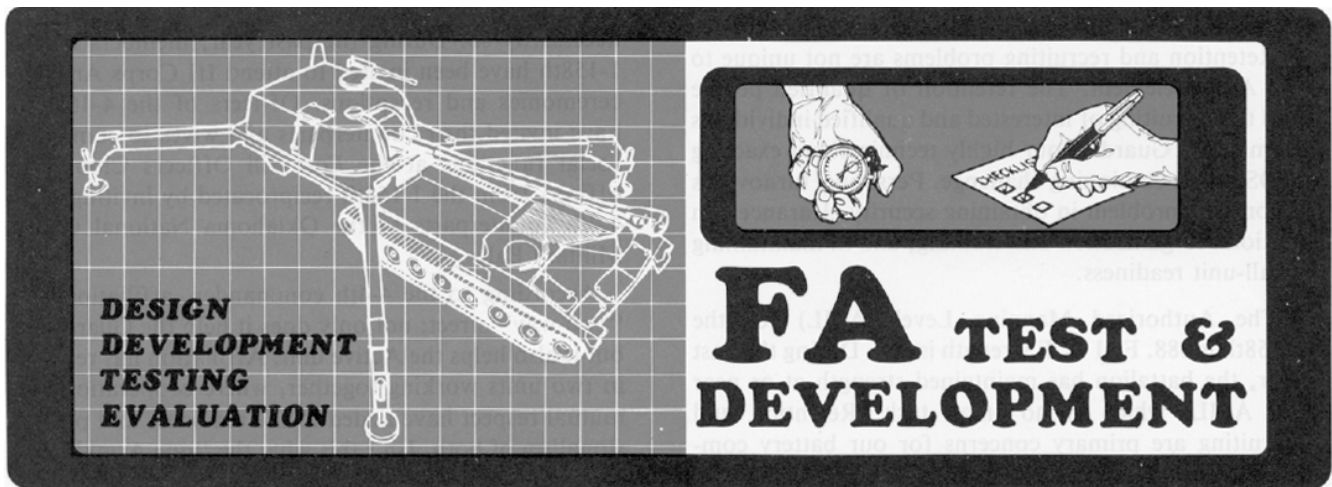
**LTC Merrill B. Burruss Jr. is the Commander of the 1st Battalion, 158th Field Artillery, Oklahoma Army National Guard.**

### Multilingual fire missions

In 1815, during the Battle of New Orleans, orders to the three American artillery batteries were given in three different languages. Apparently the orders were understood, since the Americans won the Battle.

One of the batteries was Jean Laffite's (a pirate from the island of Baratavia) gun crew which spoke Spanish. The battery from the New Orleans area spoke French, and the other battery, a Regular Army crew, spoke English.

*Courtesy of COL (Ret) Robert M. Stegmaier*



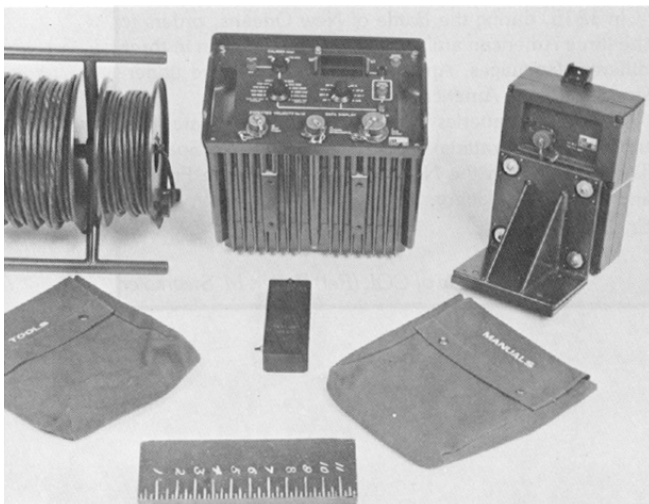
### Velocimeter in production tests

The XM90 chronograph (velocimeter) contract was recently signed by representatives from the Armaments Readiness Command and Lear Siegler, Inc., of Santa Monica, California. The new velocimeter will be able to calibrate all artillery cannon weapon systems with current and proposed propellant charges. The XM90 is a small, lightweight, doppler radar which is attached directly to a non-recoiling portion of the weapon. Unlike the M36 chronograph, the XM90 does not require a dedicated vehicle, generator, or crew.

The equipment consists of an antenna unit, display unit, test unit, connecting cables, transport case, and attachment brackets. The antenna takes less than 15 seconds to attach to the weapon and can be moved easily under operational conditions. The entire unit weighs less than 170 pounds.

Lear Siegler is currently conducting tests, with the initial production test beginning in the third quarter.

### The XM90 chronograph/velocimeter.



Plans call for one velocimeter per cannon artillery battery. Initial arrival in Europe is expected to be during the second quarter, FY 80.

### Small unit transceiver tested

The Field Artillery needs a communications system to complement the existing battery wire system. The frequent movement of the battlefield and the implementation of the eight-gun battery concept both require a more immediate command and control communications system.

The small unit transceiver (SUT), AN/PRC-68 is a small, lightweight, short-range radio which can be used in laying the battery, during convoy and hipshoots, and in periods of wire disruption. If time or other constraints prohibit laying wire, the SUT can be used for fire missions. Wire remains the primary and preferred method of intrabattery communications.

One SUT will be mounted in each self-propelled howitzer/gun, each fire direction center, and each battery operations center. It will be used in the hand-held mode in towed howitzers. Battery commanders and executive officers will also be issued a hand-held SUT.

Another use for the SUT is at observation and listening posts. The radio is envisioned to interface with the Battery Computer System and to be the data link to the Gun Display Unit.

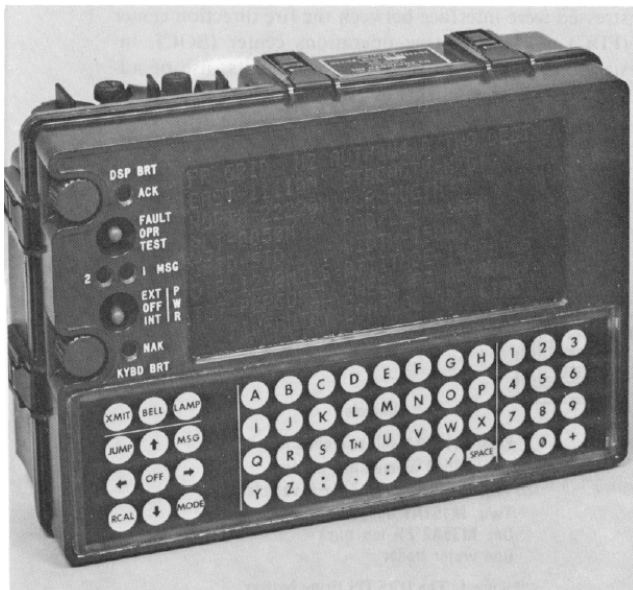
Field testing of the small unit transceiver began in October 1978 at Fort Sill and has been successful in convoys, laying the battery, firing missions, and intrabattery coordination. Fielding of the SUT is anticipated in early 1980.

## "Smart" Digital Message Devices upgraded

Potential upgrading for the forward observer's TACFIRE Digital Message Device has been completed at Fort Sill and tested by the 1st Cavalry Division Artillery at Fort Hood. Specific changes made to the DMD were:

- providing for storage of 100 authentication codes.
- using a simple key code to enter authentication codes.
- automatic sequencing to proper authentication code expected by TACFIRE.
- creating seven files to store messages for transfer and transmittal.
- adding capability to receive four incoming messages, instead of two.
- gaining the capability to save at least one incoming message which may be called up at anytime for viewing.
- offering a high or low angle option in fire request formats.
- providing priority selection in fire request format and the ability to display all stored messages.
- modified battalion software to provide automatic processing of final protective fire at battalion (straight through to the guns) and an ability to prioritize by using commander's criteria at battalion.

### The TACFIRE Digital Message Device.



A German MAN vehicle loads a general support rocket system (GSRS) launch pod/container simulator during evaluation at the Army Missile Research and Development Command. The German truck, along with vehicles from Lockheed and Pacific Car and Foundry, is being assessed for the GSRS ammunition resupply mission. MIRAD-COM is also studying the impact of GSRS on the ammunition supply system.

## Production of neutron warhead approved

Production of an 8-inch artillery shell and a Lance missile warhead, both of which can be converted to neutron effect with the insertion of a special component, has been approved by President Carter, according to Washington sources.

The Department of Energy will begin production of long lead-time items for both the neutron components and the fission shells and missiles now deployed in Europe. Another decision will be made in about 18 months on whether to produce the short-term parts necessary for final assembly of the neutron components.

Neutron weapons are designed to destroy targets primarily by radiation. The fission weapons now in Europe rely on blast and heat for their killing effects.

Proponents of neutron weapons argue that they are the best weapon to combat the Soviet tank forces in Western Europe since their radiation would kill crews inside the tanks but the reduced blast would not destroy towns adjacent to the battlefield.

Opponents argue that because the neutron weapons cause less material damage than fission weapons they would be more likely to be used and thus lower the nuclear threshold.



# DRS

## A battery commander's perspective

by CPT Kenneth R. Knight

On 1 July 1977 the Field Artillery Division Restructure Study (DRS) battery was born when Alpha Battery, 1st Battalion, 77th Field Artillery ("Falcons"), received its seventh and eighth 155-mm self-propelled howitzer sections. The "Falcons" had been selected as the DRS test battalion. A new era in the Field Artillery had begun.

The 1-77th FA Battalion Commander, LTC Homer J. Gibbs, gave an overview of DRS in the May-June 1978 *FA Journal*. This article focuses on the DRS firing battery, the DRS exercises conducted during November 1977, and the changes incorporated for the battalion exercises in July 1978.

The DRS firing battery structure evaluation was conducted in November 1977 to observe and evaluate the command and control of a DRS firing battery and its ability to operate in a combat environment. Three iterations of the evaluation were conducted using equipment and personnel authorized under the test MTOE (figure 1). A fourth iteration was conducted using necessary additional personnel and equipment.

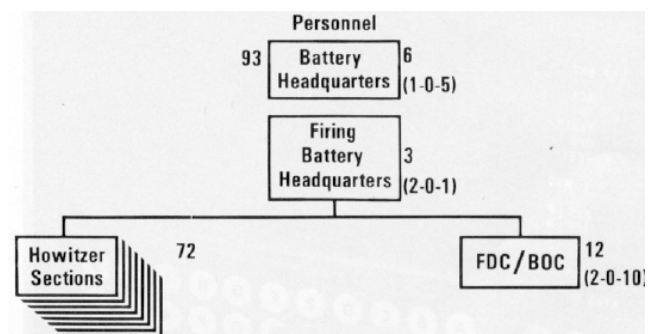
Emphasis was placed on the command and control of tactical moves, especially at night. Tactical exercise design was based on a European scenario and was 24 hours long.

The firing batteries executed all the fire missions and tactical moves required of a direct support Field Artillery battery under Restructured Division Operations Manual (RDOM) ARTEP 6-365(1). Each type fire mission was fired at least once "dry" and once live. TACFIRE was used to compute 80 percent of the missions and either FADAC or the manual mode was

used for the other 20 percent. Each firing battery completed seven tactical moves — 14 firing element moves in the split battery configuration.

### Training

The firing battery began training under RDOM 6-50-1, firing battery operations, on 15 August 1977. Initial training was conducted without troops to exercise the command and control elements of the battery. Areas stressed were interface between the fire direction center (FDC) and the battery operations center (BOC), installation of wire between firing elements, use of advance party personnel, and selection of position areas



### Vehicles

- Eight M109A1 self-propelled howitzers
- Eight M548 ammunition carriers
- Two M577 command track vehicles
- Two M151A1 Jeeps with trailers
- One M35A2 2½-ton truck
- One water trailer

Figure 1. The DRS DS firing battery.

for either the eight-gun battery or the two firing elements. Personnel participating in these initial exercises were the battery commander (BC), executive officer (XO), FDC/BOC personnel, wiremen, and the advance parties. All vehicles except the howitzers, the ammunition carriers, and the battery's 2½-ton truck were used.

The firing batteries progressed into field training with all available personnel and equipment. Training began in a "dry" status and, as proficiency of the gun crews and FDC/BOC increased, live fire began.

During the four weeks of live-fire training, firing batteries displaced three to four times daily. At least one of the moves was to an alternate position under emergency conditions. Displacements were generally 1 to 1.5 kilometers in distance. The battery was configured into two elements 70 percent of the time and as an eight-gun battery the remaining 30 percent.

The battalion supported the batteries throughout their battery-level training, using only that equipment which would be available to a battery during battalion training. The battery received two hot meals and one "C" ration daily. A survey team was attached throughout the training period but was removed periodically so the firing battery would have to become proficient in hasty survey techniques. A maintenance contact team was also attached from the battalion's maintenance battery.

The one major problem that became apparent once the DRS exercise began was lack of mobility. The DRS test required seven tactical displacements per element (14 per battery), the majority of which were made during the hours of darkness. The number of moves, especially at night over long distances, were not anticipated. Transporting the required people to the proper places was impossible at first.

### **Command and control**

Prior to the DRS training, the battalion commander made the decision to change the role of the battery commander from officer in charge of reconnaissance, selection, and occupation of position to that of a commander who primarily stayed with his battery and "fought his guns," thus putting the most experienced officer in the battery to have more influence on the critical actions of the unit. The choice of who would supervise the advance parties was left to the battery commander. In all three batteries, senior NCOs rather than officers were selected.

### **Advance party**

Initially one battery attempted to use a single NCO as the advance party NCOIC. It soon became apparent that one supervisor was not sufficient to establish two firing positions and a two-team advance party system was adopted (figure 2). The gunnery sergeant was selected to supervise the advance party of one element while the

chief of firing battery (CFB) or first sergeant supervised the other element. The highly mobile situation of the DRS scenario required that the two senior NCOs of the advance parties be absent from the firing battery most of the time. These two NCOs had to be proficient in map reading and be able to establish survey control between firing elements. All NCOs had received training in these areas, but few had had the opportunity to practice what they had learned. Therefore, initially most of the senior NCOs were deficient in these areas.

### **Advance party personnel**

One chief of firing battery or gunnery sergeant.  
Four gun guides.  
One fire direction center guide or one battery operations center guide.  
One communications man/driver.

**Figure 2. Advance party (one per element).**

Equipment for the advance party was a problem. The one gama goat available for use by the advance party was too small to transport the 12 to 14 personnel required. The only alternative was to use the 2½-ton truck with the water trailer belonging to battery headquarters. This vehicle lacks mobility, has no communications, and is constantly engaged in picking up rations, water, supplies, etc., and therefore was not readily available. Since both advance parties used one vehicle, one party was without transportation after it was dropped off at its new position; thus, a recall or repositioning of this advance party was time-consuming, especially if the gama goat was laying wire between the new element positions. The advance party without the gama goat was virtually cut off in an emergency situation.

The lack of communications between the firing battery and the advance party created problems. It was impossible for the advance party to be recalled, to be moved to a new position, or to pass tactical information. There was no way for the two advance parties to obtain common direction using a simultaneous observation until the wire line between elements was established. To provide communications, one of the two AN/PRC-77 radios used on listening posts was given to the advance party, thus creating a deficiency in the battery defense.

For one iteration of the battery DRS test, the advance party was provided an AN/PRC-77 radio and an additional gama goat. This quick fix eliminated all of the aforementioned problems.

### **The firing elements**

As shown in figure 3, supervisory personnel in the firing battery position area consisted of the BC, the XO,

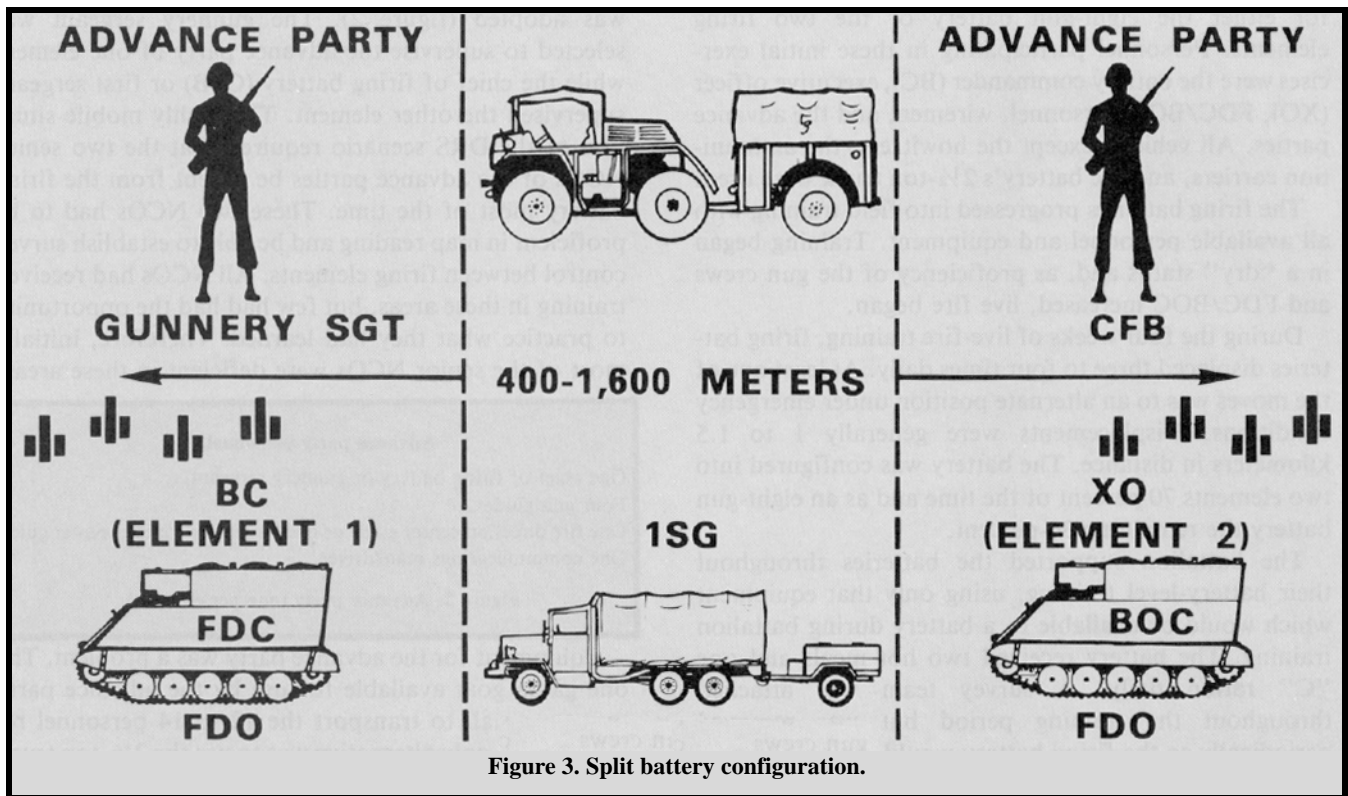


Figure 3. Split battery configuration.

and FDO per element, and either the 1SG or the CFB. With the advance parties continually on the road, the elements were left with a minimum of command supervision. The one senior NCO left in the battery, either the 1SG or CFB, had traditional duties which included developing the defense plan, positioning early warning OPs, supervising troop feeding, etc. These duties left little time to actively supervise the gun lines.

#### FDC and BOC

The FDC controlled all fires and generated fire commands for both elements, with the BOC monitoring. A wire line was established between the two elements to send fire commands to all eight howitzers. Though RDOM 6-50-1 envisioned use of the BOC only in a backup role, the BOC assumed control of the fire of its element at least 50 percent of the time because of the mobile environment confronting the batteries. Because of the heavy use of the BOC and the large number of fire missions, all firing battery commanders felt that FDOs were needed in both the FDC and BOC, especially for continuous operations (figure 4). This meant that the FDO with the BOC was not able to assist in supervising the gun line as anticipated.

#### Battery commander and executive officer

Because of the requirement for both FDOs to be with their sections and because of the almost constant absence of the advance party, the battery commander and the executive officer were the only personnel able to

supervise the line of metal. The battery commander became, in effect, a firing element commander rather than the supervisor and controller of the actions of the entire battery. He not only supervised the line of metal, but also led the march column during displacements. All commanders felt that the rapidity of actions portrayed by the scenario dictated the commander's presence with one element while the XO remained with the other.

During the final repetition of the DRS battery evaluation, an additional officer was placed in the battery as a firing element supervisor. The additional officer allowed the battery commander the freedom needed to command his battery. The commander could move back and forth between elements, troubleshoot problem areas, and occasionally go forward with advance parties.

Personnel	
FDC	BOC
Assistant XO (LT)	Assistant XO (LT)
Fire direction sergeant (E6)	Two battery display operators (E5s)
Battery display operator (E5)	TACFIRE operations specialist (E4)
TACFIRE operations specialist (E4)	Fire direction specialist (E4)
Radiotelephone operator (E3)	Radio telephone operator (E3)

Figure 4. Fire direction section personnel.



### **Howitzer communications**

Each battery experienced difficulties with control during displacements, especially at night and during emergency displacements. Because of the fast-moving tactical scenario, it was difficult to disseminate, in a timely manner, information such as routes of march and locations of alternate positions or future positions. The small unit transceiver (omitted from the MTOE) would have eliminated this problem.

The batteries developed SOPs using points 400 to 600 meters outside the perimeter to rally during emergency displacements or to rendezvous during night moves. This alleviated many problems encountered in control of movements.

### **Firing battery defense**

With the loss of the ammunition, mess, and full wire sections, coupled with the loss of one cannoneer per howitzer section, the firing battery was drastically reduced in its ability to maintain a perimeter defense. The actual *manning* of the perimeter was not possible. Increased emphasis was placed on early warning to provide time to either displace or prepare to defend the position area. One or two outposts equipped with an AN/PRC-77 were established in each battery area, overlooking the avenues of approach into each firing element. The maintenance section attached to each battery was used when available to provide early warning from the rear. The batteries relied heavily on SOPs, defense planning, and reaction forces.

### **Mess**

Initially, the service battery delivered meals to the firing batteries. This caused several problems. Primarily, the delivery vehicle had no radio and would often arrive after the battery had displaced. Drivers became lost, causing chow to be delivered late. These problems were overcome by establishing a central pickup point, designated ahead of time and changed for each meal. The firing battery used the 2½-ton truck, normally supervised by the 1SG, to pick up chow. Chow was delivered and fed to one element at a time, which required two or three hours to complete a meal. The one water trailer in the battery was insufficient to service the needs of both elements during the summer months.

Initial soldier reaction to the feeding process was very unfavorable. Gone was the personal touch of the battery cook feeding in the position area and the luxury of hot soup and coffee at night and hot shaving water in the morning. Battery commanders quickly realized that, due to the large number of moves required, a battery mess was not feasible. Once the problems in the system were worked out, the chow situation was generally accepted.


### **Maintenance contact team**

A maintenance contact team was attached to each firing battery and used a "fix forward" concept. Each contact team was supervised by an E8 maintenance team chief and had its own recovery capability. The contact team handled all activities pertaining to repair or evacuation of inoperative equipment. Battery commanders did not become directly involved in maintenance operations above crew/operator level. Any maintenance above first echelon became the responsibility of the maintenance battery and, ultimately, the battalion commander. Under this new system, one thing that quickly became defined was operator maintenance versus second echelon maintenance. If either the operator or the mechanic was not doing his job, it quickly became evident which one was not. No longer did the mechanic do all of the work on a vehicle because he "belonged to the battery." An excellent rapport was established between the maintenance contact teams and the batteries.

### **Conclusions**

All commanders agreed that there is a need for some changes in personnel and equipment.

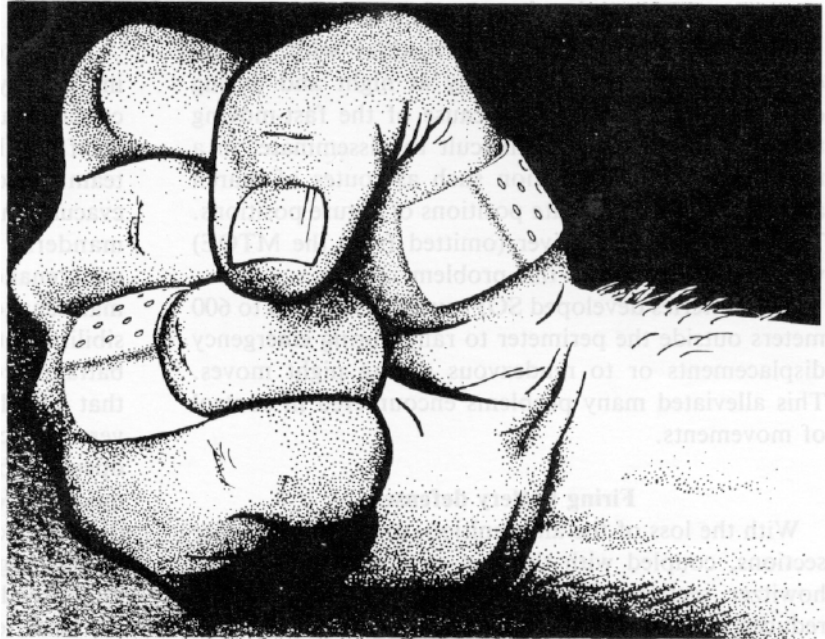
- An additional officer is needed to supervise one firing element, thus freeing the battery commander for reconnaissance and closer supervision of the entire battery.
- An additional gamma goat, two AN/GRC-160 radios, and two additional aiming circles are needed.
- We must have enough mermite cans to feed both elements simultaneously.
- Each howitzer must have its own radio communication, and there must be an internal battery radio net for command and control during convoy.
- Each battery must have two complete FDCs in lieu of an FDC and a BOC.
- The firing battery needs a water trailer direct exchange capability with service battery.

The restructured eight-gun battery permits the firing battery commander to focus entirely on "fighting his guns." Almost all of the logistical and maintenance problems are now the concern of the battalion commander and his staff. All commanders involved in the evaluation believe that the DRS firing battery is a very viable concept and that it can achieve the goals of increased firepower and survivability. 

**CPT Kenneth R. Knight was Commander, Battery C, 1st Battalion, 77th Field Artillery, when the article was written. He is now attending the Infantry Officer Advanced Course at Fort Benning, GA.**

# "Quick-fix" delivers FIST now!

by 2LT Benjamin P. Dean



**Q**uick-fix, the technique of using on-hand assets, represents the best and most immediate means to successfully implement the Army's fire support team (FIST) organization and doctrine now. Pioneers in the transition have clearly demonstrated the value of a company-level fire support team. Unfortunately, a variety of obstacles associated with the changeover to FIST have afforded ample opportunities for foot-dragging and indifference among skeptics. For those who are just beginning to grapple with the new system, the headaches and frustrations are certainly not imaginary. But, as many recently converted FIST believers will attest, those problems are not insoluble.

The FIST concept was tried in the 24th Infantry Division at Fort Stewart, GA, during recent exercises such as company and battalion evaluations, Solid Shield 1978, and Gallant Eagle 1978. Having faced the demands of transition, I would like to make certain specific recommendations based on experience which may help other FIST chiefs bridge that initial period of uncertainty.

## **Organization**

The model FIST calls for a headquarters, consisting of a lieutenant FIST chief, an E6 fire support sergeant, and a SP4 radiotelephone operator (RTO)/driver. Together these individuals coordinate three platoon forward observer parties, each with one E5 forward observer and an E3 RTO. The FIST headquarters also should have the radio capability to monitor the company

command net and the fire direction nets of the company's 81-mm mortars, 4.2-inch mortars, and artillery simultaneously.

The principal dilemmas are how to cope with the dispersed assignment of personnel holding the new 13F MOS among maneuver companies, direct support batteries, and headquarters batteries; personnel shortages leaving key forward observer slots empty; and the temporary unavailability of authorized and essential TOE communications equipment.

## **Training**

Consider first the problem of organizing the 13Fs not yet consolidated into a common unit. Although the FIST chief will not have direct authority over the mortar FOs, he can insure that essential FIST training is accomplished by assembling the team, not only when he joins his maneuver company in the field but also in garrison by coordinating with the company commander. Initiative is important here. Invite the company or battery commander to send those personnel to be integrated into the 13F MOS to 13F classes being conducted. Training emphasis must be on developing the confidence of former artillery FOs in registering and adjusting mortars and likewise mortar FOs handling artillery fires. Concurrent training must also be conducted to insure that everyone, including the personnel in the various FDCs, is thoroughly accustomed to handling a common call for fire. The FIST chief must personally assume the responsibility for assembling and training a team, even if the team members are administratively

dispersed. The FIST will gain more respect and credibility if the chief works to develop it into an effective, integral part of the maneuver unit's operations.

Another problem is the inevitable manpower shortage. Forward observer slots in batteries and mortar platoons often have been among the last to be filled. As a major priority, the FIST chief himself must campaign for a fair share of available personnel--both quantity and quality--and actively recruit interested and eligible personnel to the new 13F MOS. But remember, the FIST in its most basic form can function with as few as four individuals--three platoon FOs and a chief. Our own experience with personnel shortages showed that, when necessary, we could split a well-trained E5/E3 FO team between two platoons by giving special emphasis to the junior enlisted RTO, accelerating his development through intensive training in basic observed fire and fire planning, and then building his confidence in initiating missions in tactical exercises. One of the most significant advantages of the FIST concept is that an individual with minimal training can be more productively used when integrated into a well-coordinated system. A man with specialized skills, even though these skills may be limited, can still be a vital asset to a platoon leader under the monitoring of the FIST chief. Similarly, a shortage of officers should not preclude a full complement of FISTs to each maneuver battalion because E5s who have a thorough understanding of FIST operations can become capable FIST chiefs when necessary.


### Communications

How can you establish a FIST system with insufficient radios to monitor the required frequencies? Here again, a realistic perspective of minimum requirements shows that a FIST headquarters can actually maintain control over the system with a single radio judiciously employed. This demands that the FIST chief be collocated constantly with the company commander and continuously monitor the 81-mm fire direction net. The 4.2-inch mortar or field artillery net is preset as prearranged with the battalion FSO. The FSO will be aware that he must use the appropriate company 81-mm mortar net to contact the FIST chief; the FSO can always be contacted on the 4.2-inch mortar or artillery net.

Depending on the tactical situation and local SOP, platoon FOs can be instructed to send all calls for fire directly over the 81-mm mortar net which is monitored by the FIST chief. The FIST chief can break in at his discretion to redirect the caller or to relay the call to either the 4.2-inch mortars or the artillery and instruct the platoon FO to return to the 81-mm mortar net at the end of the redirected mission. A second radio provides the FIST chief added flexibility to monitor the company

command net or maintain continuous contact with the FSO on either the 4.2-inch mortar or artillery frequency. With these two radios and two channels preset, the FIST chief has immediate access to the three principal FDCs and the company command net, putting him in instant contact with all platoon FOs, the company commander, and the FSO. As more radios become available, communications become more centralized and the FIST chief increases his control. Even if all authorized equipment is on hand, contingency plans must be developed for shortages caused by inoperative radios in the field.

The first step toward overcoming communication problems is to practice in garrison under the most ideal circumstances possible. Among all available FIST personnel and equipment, assemble a full team and a complete set of TOE communications equipment for a group demonstration. Assign individuals to other radios representing each of the three FDCs. After thorough training has been carried out under these ideal conditions, reassemble the actual FISTs with the equipment they actually will have available in the field. Practice under conditions that are less than desirable represents the realism of operating in a situation of limited resources and will prepare teams to operate during the difficult transition until complete teams are possible.

Most significant, however, is that the FIST must be able to function effectively under difficult conditions with minimum men and equipment during training because, under the stress of a combat environment, the FIST chief must be able to hold his team together. Shortages of both men and equipment are the norm in combat. They must be expected and prepared for. Only through aggressive, innovative training can FIST be immediately implemented and successfully sustained during critical circumstances. The challenge is directed to the individual FIST chief--he must become the primary motivator and driving force to make the concept a reality. 

*All CONUS Active divisions have converted to MTOEs for FIST. Though "authorizations" are in effect, some quick-fix techniques must be employed until shortages of personnel and equipment are corrected. Local separate stationing of artillery and maneuver units at the 24th Division's Fort Stewart and nearby Hunter Army Airfield are similar to separate stationing problems in US Army Europe and within Reserve Component units.--Ed.*

**2LT Benjamin P. Dean, a former FIST chief, is the fire direction officer of B Battery, 1st Battalion, 35th Field Artillery.**

# REDLEG Newsletter

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## FA MILPERCEN update

Telephone numbers and monitors for the Field Artillery MILPERCEN team are updated below to reflect recent changes in personnel.

### COMPANY GRADE ASSIGNMENTS (DAPC-OPE-F)

LTC Leslie E. Beavers	Chief	0116
MAJ William H. Ott	CPT CONUS	0116
MAJ Glen D. Skirvin	CPT Overseas	0116
CPT Joseph W. Eszes	LT Overseas & CONUS	0118
CPT James E. Shane	Officer Adv Crs	0187
MAJ James M. Gass	Special Studies	0187
CPT Leo J. Baxter	Personnel Actions	0701

(DAPC-OPE-P)

### MAJOR ASSIGNMENTS (DAPC-OPM-S)

MAJ Joe Siraco	CONUS	0686
MAJ John C. Truesdell	Overseas	8858

### LTC ASSIGNMENTS (DAPC-OPL-A)

LTC Michael W. Gilmartin	CONUS	9789/979 3
LTC David Roche	Overseas	

### COLONEL ASSIGNMENTS (DAPC-OPC-A)

LTC Roderick L. Carmichael	A-K	7863
LTC Joseph W. Bagnerise Sr.	L-Z	

### PROFESSIONAL DEVELOPMENT DIVISION (DAPC-OPP-S)

MAJ Daniel R. Larned	Specialty Monitor	0250
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(Temporary)

AUTOVON Prefix: 221  
Commercial: (202) 325-XXXX

## Date set for new OER

A new officer evaluation report system has been approved and is set to go into effect about 1 October 1979 according to a recent announcement by Chief of Staff GEN Bernard W. Rogers who said that the new system has the potential for doing a more credible job than the current 67-7 report.

Rogers said all officers will get a final report under the current system before going to the new system to "ensure a degree of fairness that was lacking when we changed systems in the past."

The new procedure includes a number of features not a part of previous systems. Highlights include:

- Participation by the rated officer who will be able to provide his point of view on his job by describing his duties, responsibilities, and objectives at the beginning of the rating period. At the end of the period, the rated officer may comment on how well he has achieved his objectives.

- The current system of having a rater, indorser, and reviewer will change to a rater, an optional intermediate rater, and a senior rater. DA officials expect that most officers will be rated by only two individuals, the rater and the senior rater. The senior rater will play a very important role in the evaluation system.

- DA will maintain a profile of senior raters to permit comparison of a specific rating and the normal rating tendency of the senior rater. The senior rater's history will be tracked and made available to boards and managers.

- Increased communication, development of subordinates, and the setting of objectives will be emphasized.

- Army personnel management programs will be vigorously supported and a greater focus on open channels of communication and "constructive problem solving" are expected.

- Increased administrative accuracy is expected by simplifying such items as the accountability of rating periods. The rated officer will review and authenticate administrative data.

The new system will use three forms:

- A rating form, DA Form 67-8, which is essentially a revision of the current form. However, the new form will not include a numerical score.

- A support form, DA Form 67-8-1, which will provide input from the rated officer and provide for discussion between the rater and rated officer.

- A tracking form, DA Form 67-8-2, which will clock the rating history of senior raters.

## **Officer assignment policy changed**

Most officer advanced course (OAC) selectees will be notified of their post-OAC assignment from three to five months before they attend the course, according to MILPERCEN.

The advance assignment procedure will begin with FAOAC Class 4-79. The new policy is based on a test of the system last year which showed that advance assignment procedures were valuable to individual officers and in personnel management.

Some added personnel actions that officers must take when requesting OAC orders are involved in the new policy. Your local MILPO can provide details.

## **Course application deadline near**

Colonels and lieutenant colonels have until 1 February 1979 to apply for the Army War College Correspondence Studies course that begins in July.

The course parallels material in the resident course and is designed for completion in two years. The course includes a resident phase at the end of each year. Course completion leads to equal consideration with resident graduates for assignments requiring senior service college according to MILPERCEN.

Applicants must have at least 15 but no more than 25 years of service as of the 1 July 1979 course starting date. More information is available in AR 351-11.

## **Accompanied travel approved for junior enlisted**

Allowances for families to accompany E4s with less than two years service and lower ranks assigned overseas have been authorized by Congress as part of the Fiscal Year 1979 Defense Appropriations Act.

Defense Secretary Harold Brown said that, without junior enlisted travel (JET) allowances, young service families face severe financial hardships or forced family separation and, if Congress failed to provide JET, there would be an erosion of the effectiveness of young married service members.

Senate-House conferees established a worldwide ceiling of 350,000 military dependents overseas, including the additional young service families.

In addition, the JET package allows single soldiers to ship a privately owned vehicle to authorized areas and increases from 225 to 500 pounds the weight of personal baggage that may be shipped at Army expense.

Soldiers are cautioned, however, about high automobile insurance rates which start at \$400 in Germany for single persons under 24. Non-leded gasoline is not available in Europe, and there is a critical shortage of parts for cars more than six years old.

## **European bachelor tours cut**

First-term single soldiers (male and female), who are serving in Europe, will have their tours reduced from three to two years beginning 1 January.

Soldiers arriving in participating commands after 1 January, who qualify for the tour reductions, will serve two-year tours. Soldiers already serving in these areas for more than two but less than three years will have PCS dates adjusted and will serve from 24 to 36-month tours, depending on when they arrived.

The phased tour reductions will apply to soldiers in Germany, Italy, and several other countries. Soldiers on attache duty and soldiers with six months or less remaining until ETS do not qualify for the tour reductions.

There are strict guidelines that define single (bachelor) soldiers, so personnel are advised to check with local MILPO for answers to their questions.

## **FA first sergeants increasing**

The Field Artillery First Sergeant Program has been in effect since July 1976. During this time, 54 E8s in 17 combat support and combat service support MOSSs have served, or are currently serving, as FA first sergeants. CONUS installations participating in the program are: Forts Sill, Hood, Lewis, Riley, Ord, Polk, and Stewart, with Fort Carson projected for participation.

## **Concurrent means together for Army families**

Dependents authorized concurrent travel overseas must travel with their sponsors and not later according to MILPERCEN. Some dependents are arriving in Europe later than their sponsors although they were allowed concurrent travel. This is causing problems in reimbursing soldiers for dependent travel costs. Permission must be obtained if dependents wish to travel separately from sponsors.

## Redleg Newsletter

### **Added PCS moving time allowed**

Soldiers who must attend a school while on TDY, and just before a PCS move, may be allowed 10 days in addition to leave and travel time to move and resettle dependents. The 10 "free" days are available in three of four options soldiers will have when they attend DA directed TDY schoolings in conjunction with PCS.

The four options are:

1) Soldiers with dependents in Government quarters may leave dependents in these quarters until they complete TDY and then receive 10 added days to move them before PCS. This option is allowed for moves within CONUS or from CONUS to an overseas station.

2) Move dependents from CONUS or overseas station to a CONUS station before TDY and receive 10 extra days to resettle dependents.

3) Return to present CONUS station after TDY and move dependents, residing on local economy, to any new duty station and receive 10 added days before reporting to a new station.

4) Soldiers may clear any present duty station before going TDY and have dependents accompany them to the TDY station or another station at personal expense. They will not receive 10 extra days.

They may arrive at any new station as scheduled and receive dependent travel reimbursement based on the best direct route between stations.

These options are available to both officers and enlisted men. Enlisted men who are sent TDY as a requirement for new assignments, such as airborne, ranger or special forces, may not choose option 2 or 4. In addition, these options do not apply to soldiers attending civilian schooling in a "permissive TDY status."

Soldiers alerted for combined TDY and PCS moves should be counseled about these options, and questions should be referred to local military personnel offices.

### **NCOES selection made**

The zone of consideration for selection to Advanced Noncommissioned Officers Education System (NCOES) is based on date of rank (DOR) to grade E6. The selection board for FY 79 schooling considered E6s with a DOR of 1 April 1973 through 31 March 1976, and a basic active service date of not earlier than 1 October 1961. The zones of consideration are structured so that each soldier's record will be considered by four consecutive boards. CMF 13 had

432 selected out of 972 eligible by the last selection board.

### **Delays in NCO retirement**

Many NCOs are discovering that, because of service obligations, they are not permitted to retire immediately upon completion of 20 years active duty. The three most common service obligations are reassignment from overseas to CONUS (1 year at CONUS station), selection for overseas movement (5/6 of a normal tour or 12 months, whichever is longer), and promotion to E7 or above (2 years).

Soldiers promoted to E7, E8 or E9 have a two-year service obligation before voluntary retirement. Reenlistment or extension is not a precondition for accepting a "top three" stripe, but these soldiers will not be allowed to retire until they have served at least two years in grade.

Although waivers are allowed, they are approved only in instances of severe hardship. If you have evaluated your situation and have determined that you wish to retire as soon as possible, you may be able to insure retirement by extending your current overseas tour or, if in CONUS, volunteering for an overseas tour early in order to be back in CONUS before you complete 19 years.

### **Flight training available sooner**

Officers may now enter flight training immediately upon completion of the Officer Basic Course. This is a change to the current Army policy which has required officers to serve 24 to 36 months in their basic entry specialty before attending flight school.

The policy change, which is expected to be effective in early 1979, will help fill expected shortages of company-grade aviators.

### **Overseas jobs risk benefits**

Soldiers who separate from the Army and take a job overseas will jeopardize their eligibility for unemployment compensation when they return to the US, according to MILPERCEN.

Veterans who have not been employed since leaving the service are usually eligible for unemployment benefits in all states, but a discharged soldier who works at an overseas job after leaving the service will lose eligibility for such benefits in most, if not all, states.

Legal assistance and state employment offices can provide specific details on this subject.

### **Fitness and weight policies explained**

Soldiers must score a minimum of 300 out of a possible 500 points on the physical fitness test and at least 60 points on each of the five test events according to a recent DA message. Those failing to meet minimum physical training standards must undergo special conditioning programs.

A change to AR 600-9 will require soldiers to retest within 60 days after failing fitness tests. Soldiers who fail to pass more than once may be separated from the Army if repeated failure is "indicative of apathy, medical complications, or other causes," officials said.

Commanders are reminded that there are some exceptions to the weight control restrictions on reenlistment. These exceptions take into consideration such things as body build, bone structure, muscular development, and medical problems (see AR 600-9, para 3-5a). Exceptions also apply when a "medical condition exists which interferes with weight loss and disability separation is inappropriate." These cases must be documented.

Weight-lifters and body-builders who do not meet weight standards but who are not obese may reenlist, and soldiers under other policy exceptions may extend.

### **Writing SEERs**

"Staff Sergeant W has delivered a lackluster performance as a howitzer section chief. He is content to put forth the minimum effort as a troop leader."

"SSG X does not set any standards for his section."

"SSG Y is very weak in his performance, doesn't show initiative, and is not dependable or conscientious in fulfilling obligations."

"SSG Z must be double-checked on every assigned task; his attention to detail leaves much to be desired."

The above quotes are all taken from Part K of Senior Enlisted Evaluation Reports (SEER). These four individuals are shown to lack the basic NCO qualifications of leadership and job knowledge. They have something else in common which is even more disturbing--they meet or exceed the standards of the units to which they are assigned and are considered qualified to be promoted with their peers.

Part G of the SEER contains a section labeled "Exceeds or Meets Duty Requirements." Part H has a section "Promote with Peers." Each of the four individuals were scored in these sections. The raters and indorsers are guilty of inflating the SEER score and guilty of lowering their standards and those of all NCOs. These four reports, unfortunately, are not isolated examples but are typical of approximately 15 percent of the reports received.

Remember when you rate a person as meeting or exceeding duty requirements and as being qualified to be promoted, you are setting the standards for yourself, your unit, and the rest of the Army.

### **Add-on service trimmed**

Add-on active duty service obligations for soldiers attending civilian schooling programs of less than 20 weeks have been eliminated by the Army in a change to AR 621-1. Soldiers attending less than 20 weeks of degree-completion, permissive TDY, or cooperative degree programs at civilian institutions will not incur an additional service obligation.

The change brings these schooling obligations in line with short course training programs that also exclude added service obligations for programs shorter than 20 weeks.

### **Alternate specialties for Year Group 72**

Field Artillery officers who entered the Army during FY 72 have until the end of January to select the alternate specialties that they will serve in when not filling primary branch assignments, MILPERCEN officials announced.

Information and instructions have been sent to individual officers that will help them plan career specialties. Officers in Year Group 72 must list four priority alternate specialties and will be notified of final MILPERCEN alternate specialty assignments in April. These officers are encouraged to review DA Pamphlet 600-3 and to discuss careers and specialties with their career manager.

The Journal interviews . . .

# COL Gerald E. Monteith

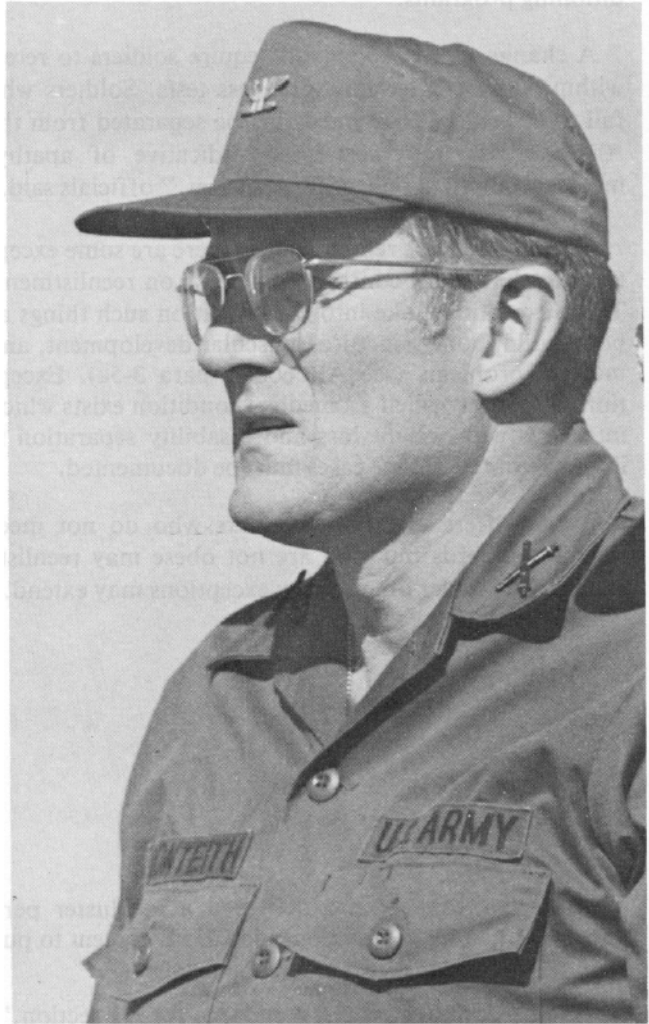
Just prior to completing his assignment as Commander of the 6,500-member US Army Field Artillery Training Center, COL Gerald E. Monteith was interviewed by the *FA Journal*. A 1955 graduate from North Dakota State University, COL Monteith was commissioned in the Military Police Corps. In 1957 he transferred to the Field Artillery. COL Monteith commanded a battalion in Vietnam and also at Fort Carson, CO. He is a graduate of the Industrial College of the Armed Forces and has an MS degree from George Washington University.

*Journal:* What are your feelings as you look back over your 18 months of command?

**Monteith:** It's been a great job — just great. I came here with mixed emotions as every colonel would like a division artillery, but this has been tremendously rewarding. You can really see the results of your efforts. I've had a lot of flexibility and the chance to use my imagination.

*Journal:* What was the biggest problem in commanding ATC?

**Monteith:** Preventing trainee abuse. Somehow the trainee becomes a natural object for abuse, a target, someone to pick on. There is too common a feeling that this harassment, the hazing, the "Mickey-Mouse" treatment are a necessary part of his training and somehow make him tougher and a better soldier. This is wrong. Abuse is not tolerated. There is no time for "Mickey Mouse." We turn out tough, well-disciplined soldiers, through tough, demanding training done in a professional manner. We train soldiers by setting standards, demanding they meet them, setting the example, giving them the training they will need, and doing everything as professionals to "turn them on" to the Army. That in no way means we molycoddle trainees. We drive them up to 16 hours a day, seven days a week. I believe the FATC has the most outstanding, truly dedicated noncommissioned officers in the Army as our drill sergeants. Their job is extremely demanding and they do a great job. We expect they will make mistakes, and we



(Photo by PFC Jose Ruiz)

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tolerate and learn from these mistakes. We do not, however, tolerate violations of the law on training abuse.

*Journal:* What has been your most satisfying experience?

**Monteith:** Feeling that we have turned out a better-trained and better-motivated soldier has been the greatest reward. We have instituted a lot of programs aimed at turning out a better-motivated soldier who *wants* to do a good job, who *wants* to wear the uniform properly, who *wants* to comply with regulations, etc.



**Journal:** There is great attention being paid to the number of recruits who do not finish basic. What are some of the factors affecting the "washout" rate?

**Monteith:** Our washout rate for Fiscal Year 77 was 17.2 percent for all causes. Chief among those causes were medical conditions which existed before personnel came in the Army — more than half our losses are for medical reasons. The next largest group is for attitude. After that there are a host of minor categories — alcohol or drug problems, homosexuality, etc. The overall rate dropped last year (FY 78) to 10.8 percent. Again medical was more than half. I like to think that the big drop was due to the programs we have to motivate or "turn on" soldiers. One reason for the better statistics is we are getting a better-motivated soldier from the Recruiting Command. They are quite a bit younger — more 17 and 18 year olds — than last year. Also, the Armed Forces Examining and Entrance Stations are doing a better job of screening out medical problems. There are a lot of factors, but I want to assure you that the standards for graduation have not gone down.

**Journal:** Talking about the younger soldiers, what are some of the other demographics of the trainee population? Do you see any trends related to race, sex, or marital status among trainees?

**Monteith:** The statistics show that the number of married recruits in FY 78 was down from 16 to 12 percent; this is partly explained by the fact that our soldiers are younger — about 75 percent are in the 17- to 19-year age bracket. They are really enthusiastic; they are here to learn to be soldiers. Almost 50 percent are high school graduates. This statistic is skewed by about 500 National Guardsmen who came here for training between their junior and senior year of high school. In the mental categories, 58 percent were in categories IIIB and below which is the lower half of the US population. Some people are concerned about that, but I feel that if a soldier is well-motivated and dedicated to his job, he'll do fine. Our statistics do not show any significant correlation between the various demographics and how the soldiers do in ATC. In ethnic categories, we lose fewer blacks and I think that is because of the current economic picture in the civilian sector (high unemployment among young blacks). There is a higher attrition among our Guardsmen but that is due primarily to medical exam procedures which are being corrected. We have experienced some language difficulties with our Spanish-speaking soldiers, but they are usually very highly motivated and classes in English ease this problem. We had a recent cycle of 200 plus with a Puerto Rican as the Distinguished Graduate and he spoke little English on arrival.

**Journal:** What are some of the complaints you get from

field commanders about the quality of troops you are sending them?

**Monteith:** The biggest complaint is a systemic one — that we are not teaching enough. The new 13B has not mastered the duties of gunner or assistant gunner. Of course, those jobs are one or two skill levels above what we teach here. We'd like to teach more, but, with the limitation of 12 weeks, we teach the most essential tasks and those for which we have the best capability to instruct compared to the field's capability. The skills taught in the FATC are clearly identified in the Commander's Manual for each MOS.

The quantity of complaints is fairly low, due in part to a feedback system. Either I or my deputy has been to all but two of the CONUS division artilleries and surveyed our recent graduates and their commanders and supervisors to gauge how the recent ATC graduates are doing on the job. My successor hopes to continue this process with a trip to our European FA units in 1979. One thing that has come out of this review process is that we need to do a better job of preparing our new soldier to cope in a peacetime Army. We devote almost all our time to preparation for combat and that process must continue. However, we can simultaneously better prepare him for the real world he will encounter.

**Journal:** Those "soft" subjects would take away from the already critically short time you have for basic skill instruction. If you were given two more days or one more week with each soldier, where would the emphasis go?

**Monteith:** Hard skills. We will not take away from what we have now, but there are certain things we can do like putting greater emphasis on peer leadership.

**Journal:** Which skills are the easiest to forget or the hardest to retain?

**Monteith:** Those skills with the most steps required to complete a task, or those which have a step which doesn't necessarily "flow." For example, in preparing the LAW for firing, all the steps flow logically until it comes to check the back blast area and that is the point where trainees fail. The Army Research Institute recently did a study of 500 graduates and they found that complex skills, which are not reinforced and practiced within a reasonable amount of time, are forgotten.

**Journal:** What about oral instruction versus "let me show you how" training?

**Monteith:** There is no question that the latter is better. We find that if our oral instruction in the bleachers runs more than four or five minutes, we start losing people. A short explanation, then a demonstration, and then letting the students get on the equipment works best.

**Journal:** Are recruiters "shaving" MOS entry requirements or are the trainees arriving with the prerequisite education, test scores, etc.?

**Monteith:** I'm convinced that the people we are getting are 1)trainable, 2)will make good soldiers in most cases, 3)are very capable of doing the job, and 4) have plenty of talent to feed the NCO ranks in the future. I'm very optimistic about what I see. I firmly believe we're on the upswing as far as new soldiers are concerned. Recruiting Command is giving us good people.

**Journal:** What are the major differences in training women soldiers?

**Monteith:** Disciplinary problems with women are considerably less than with males. Strenuous physical training has to be approached very gradually. If it is rushed you will get a rash of foot problems, stress fractures, and shin splints. There are a few others, but they are not significant. The biggest problem is still in the mind of the trainer. We must treat both sexes the same, demanding that both measure up to the same standards. I am convinced that this is what most females want, but too many males still let the female "get over." We try to eliminate inequities by integrating trainees by sex down to section or squad level. Because we do not yet have women for their first seven weeks of training (when most of the recruit attrition occurs) we do not have comparison figures for losses by sex.

**Journal:** This problem of the units in the field understanding the "division of labor" in soldier training — who trains what — is there any way to overcome it?

**Monteith:** The Commander's Manuals clearly spell out what skills we teach and those to be taught in the unit. Unfortunately, many Commander's Manuals are not getting into the hands of the supervisor. One thing that may help is to change the name from Commander's Manual to Supervisor's Manual, because *supervisors* need to use these books and many don't because the title says "Commander."

Because of the paucity of training facilities in the units and the great facilities at the training centers, do we need to go back and take a second look at the division of labor?

**Monteith:** We would like to do more. TRADOC would like to do more and I certainly don't want to detract from the great job the units in the field are doing in training, considering their total load of competing requirements and the lack of facilities in many cases. We know their training job is tough and we'd like to ease the burden. However, the thrust has been to push more training out to the TOE units. Monetary and manpower restraints are the driving force. The Army successfully fought to retain the present training base in the last budget cycle, but there are great pressures to cut basic one more week to six weeks, and to cut one-station unit training one more week to 11 weeks.

**Journal:** How do you rate our drill sergeants?

**Monteith:** They are outstanding and dedicated noncommissioned officers who are absolutely essential. They are directly responsible for the development of the assigned trainees from "day one." For example, in working with MOS 13B, they must insure that each cannoner masters the 67 skills for which the FATC is responsible. The drill sergeant doesn't teach it all, but he evaluates, reinforces, corrects, and insures that the trainee has mastered those skills. Each drill sergeant has up to 20 soldiers and he must know each of them very well.

**Journal:** Thank you.

**Monteith:** There is one more thing I'd like to mention. A TRADOC Form 578-R, an Individual Training Record, is prepared on each individual that graduates. That form shows the skills the soldier has been taught, how he or she did in each area, and any additional training we have given, such as 40 hours of driver training; we actually license about 10 percent of our trainees. The form also indicates whether the soldier was a peer leader in ATC and other important information. We find in liaison visits that these forms are often still in the soldiers' personal possession. On our last field trip a check of 30 soldiers showed 24 forms had not been collected. I ask battery commanders to look for these forms and share them with the soldier's chief of section.



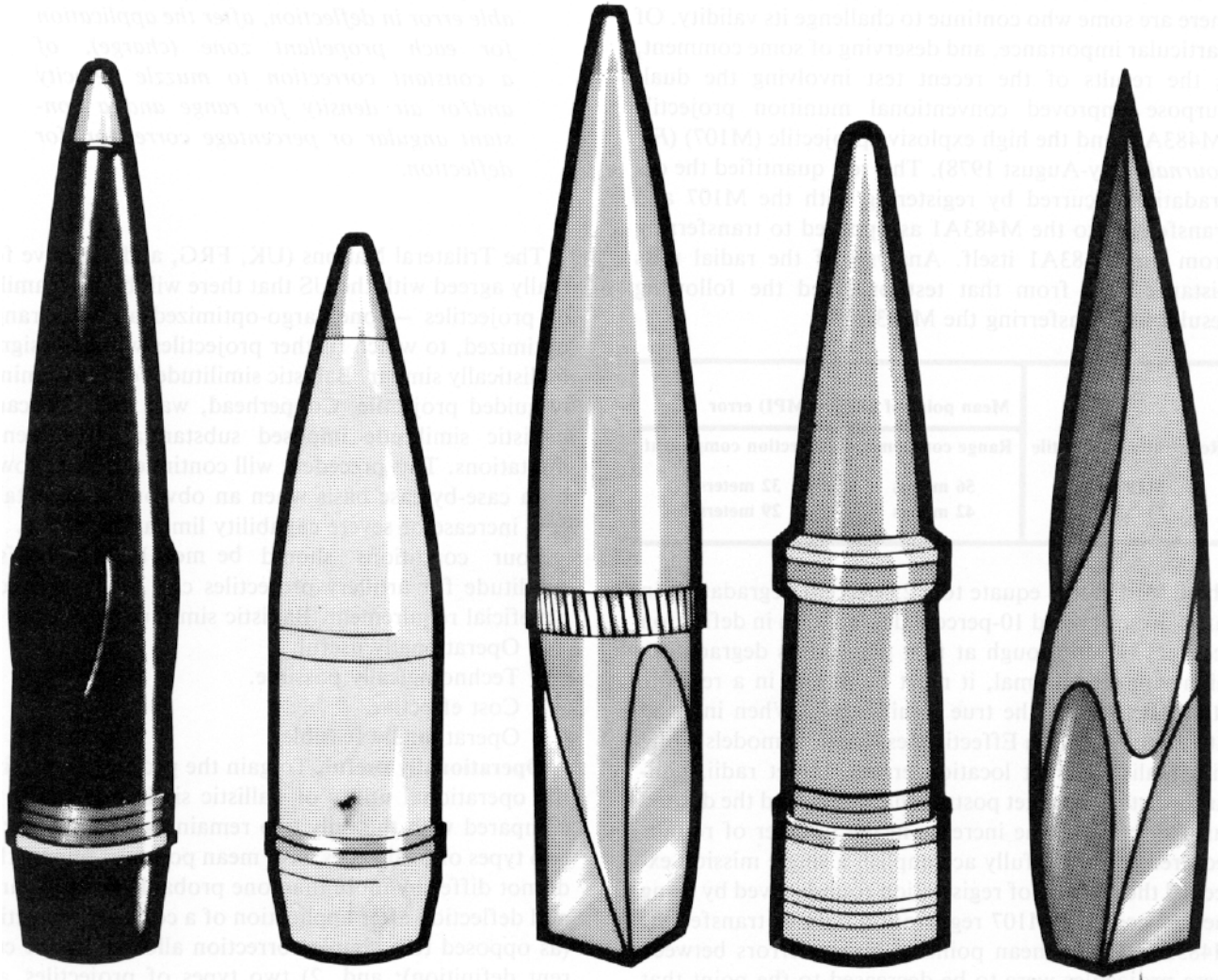
## New Name Needed

**As the eight-gun battery is likely to be the Field Artillery organization of the future, regardless of the decision on DRS, there will be a need to have a name for each four-gun element in split battery operations. Anyone with a good suggestion is encouraged to send your idea to the *Journal*. If yours is selected by the School as the "official" doctrinal name, we will give you credit in a future issue of the *Journal*. — — Ed.**

# *Ballistic similitude:*

## *Why it is necessary*

by CPT Glen Monigold  
and Mr. William Drum



In the late 1960s, the concept of ballistic matching of new projectiles to those already in the inventory was proposed by the Field Artillery School. Ballistic matching basically meant that two projectiles fired with the same data would impact within one precision probable error (PE) of each other. The concept was conceived in an attempt to solve a myriad of operational problems. With the number of different type projectiles increasing at a rapid rate, the number of tabular firing tables and other fire direction center (FDC) equipment was becoming unmanageable. FDC computations were becoming too complex. Response

times were increasing to the point of becoming unacceptable for the accomplishment of the Field Artillery mission. Survivability concerns were becoming paramount due to the requirement for firing numerous registration missions. In addition, the time devoted to registration missions obviously reduced the time devoted to actually influencing the battle. The ultimate goal was to have only one family of projectiles in each caliber with only one firing table. However, because of cost effectiveness concerns and certain technical difficulties, the concept has evolved into one of ballistic similitude (as opposed to ballistic matching) of all new projectiles within their respective family of

projectiles (cargo-optimized family or range-optimized family). Ballistic similitude basically differs from ballistic matching in that it allows a simple correction for range and deflection to be applied to cause two projectiles to impact within one precision PE of each other.

Although this approach to reducing the consequences of ammunition proliferation is generally accepted by both US and allied nation development communities, there are some who continue to challenge its validity. Of particular importance, and deserving of some comment, is the results of the recent test involving the dual-purpose improved conventional munition projectile (M483A1) and the high explosive projectile (M107) (*FA Journal*, July-August 1978). This test quantified the degradation incurred by registering with the M107 and transferring to the M483A1 as opposed to transferring from the M483A1 itself. Analysis of the radial miss distance data from that test provided the following results for transferring the M483A1:

Registration projectile	Mean point of impact (MPI) error	
	Range component	Deflection component
M107	56 meters	32 meters
M483A1	42 meters	29 meters

These MPI errors equate to a 25-percent degradation in range accuracy and 10-percent degradation in deflection accuracy. Even though at first glance this degradation might appear minimal, it must be placed in a realistic situation to show the true significance. When inserted into Joint Munition Effectiveness Manual models along with realistic target location errors, target radii, gun-target distance, target posture/hardness, and the desired casualty criteria, the increase in the number of rounds required to successfully accomplish a single mission exceeded the number of registration rounds saved by using the less accurate M107 registration data to transfer the M483A1. If the mean point of impact errors between these projectiles were to be decreased to the point that effectiveness were not degraded, then it is likely that the ballistic similitude requirement could be met and the M107 and M483A1 would be ballistically similar. In light of these results and the fact that increasing the burden on the already overburdened logistic trains is unacceptable, it becomes clear that the test supported retention of the ballistic similitude requirement. Despite some opinions to the contrary, the test results *highlighted* the need for ballistic similitude.

Before continuing to explore the validity and utility of a ballistic similitude requirement for artillery projectiles, one must know the meaning of ballistic similitude. The following is the official definition:

*Two types of projectiles with the same fuze are ballistically similar if their external shape, mass, center of gravity, transverse and longitudinal moments of inertia, surface finish, and driving band characteristics are sufficiently close to insure that their mean points of impact do not differ by more than one probable error in range and one probable error in deflection, after the application for each propellant zone (charge), of a constant correction to muzzle velocity and/or air density for range and a constant angular or percentage correction for deflection.*

The Trilateral Nations (UK, FRG, and IT) have formally agreed with the US that there will be two families of projectiles — one cargo-optimized and one range-optimized, to which further projectiles will be designed ballistically similar. Ballistic similitude for the terminally guided projectile, Copperhead, was waived because ballistic similitude imposed substantial effectiveness limitations. This precedent will continue to be followed on a case-by-case basis when an obvious unacceptable cost increase or severe capability limitation results.

Four conditions should be met before ballistic similitude for artillery projectiles can be considered a beneficial requirement. Ballistic similitude must be:

- Operationally useful.
- Technologically possible.
- Cost effective.
- Operationally feasible.

**Operationally useful.** To gain the proper perspective, the operational utility of ballistic similitude has to be compared with the only two remaining alternatives: 1) two types of projectiles have mean points of impact that do not differ by more than one probable error in range and deflection after application of a complex correction (as opposed to a simple correction allowed by the current definition); and, 2) two types of projectiles are ballistically mismatched because no known correction exists to bring the mean points of impact within one probable error in range and deflection.

Compared to alternative one, ballistic similitude has the advantages of:

- Requiring fewer firing tables in the FDC, as similar projectiles can be handled with simplified addenda to the baseline projectile of the respective projectile family.
- Simplifying manual fire direction procedures since a complex correction would require additional computational steps, which may prove difficult to teach and perform in the field.

- Relying less on computer assistance to solve fire direction problems and requiring less sophisticated computer hardware.

Compared to alternative two, ballistic similitude has the advantages of:

- Reducing the number of rounds expended in registrations, thereby improving delivery unit survivability.
- Requiring fewer firing tables in the FDC, as similar rounds are handled with simplified addenda.
- Eliminating unique spotting round requirements.

Clearly there is substantial operational utility to be gained from ballistic similitude.

**Technologically possible.** If a projectile can be fired to an impact point that is within the range capability of a second projectile, then it can be shown that a trajectory exists for the second projectile that will cause it to impact at the same point as the first. There is evidence to show that for projectiles that are generally similar in shape and weight, such as the M692 and M483A1, a simple correction exists. Therefore, ballistic similitude is possible and, indeed, quite feasible.

**Cost effective.** Ballistic similitude does not necessarily increase costs nor decrease effectiveness, especially when the requirement is within the same family of projectiles. In general, the primary projectile characteristics of weight and shape are narrowly constrained before the projectile is designed. Weight is constrained by compatibility requirements with the weapon and propelling charges with which it is to be used, and shape is determined by aerodynamic stability, structural integrity, range requirements, and compatibility with the weapon. It is within these narrow bounds that a family of projectiles must be designed regardless of a ballistic similitude requirement.

Other considerations place further constraints on projectile configuration. Production facilities are expensive to build and maintain and therefore must be used to the maximum. This is done by using common metal parts for as many projectiles as possible. The use of common metal parts for payloads of different densities may result in inefficiencies if the projectiles must be weight-matched. But the mix of projectiles that use common metal parts will normally consist of a single, high usage projectile plus lower usage secondary projectiles. Optimization of the base projectile characteristics involves stretching the design to its limits. This is an expensive and time-consuming process that is affordable only for the high usage projectile. If the design of the high usage projectile is optimized, any inefficiencies are then confined to the secondary rounds, and total system effectiveness is reduced to acceptable levels. Furthermore, there is usually sufficient flexibility in the design of the payload that, with proper attention,

the magnitude of any inefficiencies can be minimized.


Rotation band design is also a constraint. If different designs are used, all designs must be tested to determine the howitzer tube condemnation point of each; then the useful life of the tube would be fixed by the worst rotating band design.

Finally, any increased cost to achieve ballistic similitude is offset by the reduced cost of testing required to generate firing tables. Ballistic similitude check tests are much less extensive than full firing table tests (by a factor of five).

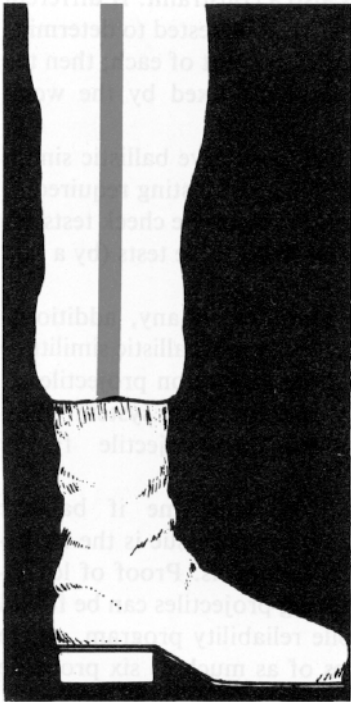
Thus it becomes clear that few, if any, additional costs can be attributed specifically to a ballistic similitude requirement, and there is little impact on projectile effectiveness and essentially none on total system effectiveness under the current two-projectile family concept.

**Operationally feasible.** To determine if ballistic similitude can be used, the principal issue is the lot-to-lot variation within projectile models. Proof of lot-to-lot variation within the existing projectiles can be found in the surveillance stockpile reliability program, where differences in mean ranges of as much as six probable errors have been found with the M107 HE projectile. Ballistic similitude corrections are determined by firing one lot each of two projectile models. This technique ignores the unknown variations induced by firing other lots of both projectile models.

This analysis indicates the usefulness of ballistic similitude may be degraded by the present constraint of projectile lot-to-lot variations. However, this problem is one of *quality control* and *not* ballistic similitude, and there are two circumstances under which the ballistic similitude requirement will become operationally feasible: 1) if the new families of projectiles developed under ballistic similitude requirements exhibit minimal lot-to-lot variance; and, 2) if future production ammunition can be manufactured to eliminate this lot-to-lot variance.

The ballistic similitude requirement was first adopted to help solve problems that arose as the number of projectile types within a caliber increased. Clearly, the extent of these problems is diminished by maintaining ballistic similitude among projectiles, and it is technologically possible; in fact, it has been achieved. All factors considered, ballistic similitude may cost nothing and have negligible effect on individual projectile effectiveness. There may be some difficulty obtaining the full benefit of ballistic similitude because of severe lot-to-lot variations within projectile types, but the possibility exists to solve this problem in the future. Ballistic similitude, adding little or no increased cost in development or production, can provide a significant increase in operational effectiveness and is a valid requirement of the Field Artillery School. 

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THE LEAVENWORTH SCHOOLS AND THE OLD ARMY: EDUCATION, PROFESSIONALISM, AND THE OFFICER CORPS OF THE UNITED STATES ARMY, 1881-1918, by Timothy K. Nenninger, Greenwood Press, Westport, CN, 1978, 173 pp., \$15.95.

Several fine studies on the development of military professionalism from the Civil War through World War I have appeared in recent years. Allan R. Millett's study of GEN Robert Bullard is a model, and Heath Twichell Jr., Graham Cosmas, and Edgar F. Raines Jr. have made worthy contributions. Timothy Nenninger of the Military Division of the National Archives adds a useful book to this collection.

The US Army did not become professionalized suddenly in the late 19th century. The process was long and evolutionary. After the War of 1812, young veteran officers realized a common sense of purpose and wished to rationalize military administration, develop a regular officer selection process, and cultivate intellectual, scientific approaches to military studies. The first steps took place during this period, but most of the major

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characteristics of military professionalism — journals, professional associations, and most importantly, postgraduate military schools — emerged between the Civil War and World War I. In 1881 the War Department established an infantry and cavalry officer training school at Fort Leavenworth, KS — the first of several Leavenworth schools to train junior officers in military tactics and administration. The training gained in content and sophistication, and a cadre of professional military officers arose from the schools.

After the Spanish-American War, Leavenworth became a postgraduate military institution, preparing senior officers for positions of high command and general staff duties. The small number of Leavenworth graduates made some impact upon the Army before World War I, and gradually the service adopted the doctrines and techniques taught at the Leavenworth schools. During the war, graduates played such important roles in the American Expeditionary Force that the Leavenworth experience became a key element in senior officer training. Today the Command and General Staff College at Leavenworth is considered the single most important experience in an Army officer's career.

Nenninger's account of the evolution of military professionalism and Leavenworth's significant import in this development is a capable study. It is well researched and documented; however, it is pedantically written, reading too much like the Ph.D. dissertation from which it came. It is not a particularly interesting book to read either in content or style. While it makes a contribution for military historians of this period and topic, it will have little appeal to the wider audience.

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VETERAN AND VINTAGE AIRCRAFT, Fourth Revised Edition, Compiled by Leslie Hunt, Charles Scribner's Sons, 1974, 336 pages, \$12.50.

This book is a reference guide to more than 9,000 of the world's oldest and rarest aircraft. The aircraft, which are scattered throughout no less than 90 countries, include civil and military production models as well as prototypes and record breakers. In addition to locating the aircraft and explaining how to see them, the author provides pertinent details on individual specimens for enthusiasts. The book is easy to use as the aircraft are arranged by country and a convenient index by manufacturer and model number is provided. *Veteran and Vintage Aircraft* is well prepared and, with its 900 plus pictures, is by itself an interesting history of aviation.

*COL Warren E. Norman is the Senior US Air Force Representative at Fort Sill.*

INSTRUMENTS OF DARKNESS, by Alfred Price, Charles Scribner's Sons, Great Britain, 1978, 283 pages, \$12.95.

*Instruments of Darkness* is a recapitulation of the history of electronic warfare. The author traces the early development of electronic warfare by the British and Germans prior to World War II. His chronology is factual and engrossing, and makes the reader feel he is a part of the British intelligence community investigating the Germans' use of radar to guide night fighters.

The British effort to discover the German systems included signal intelligence, raids, and police of battlefields. The reader feels the suspense of locating German equipment and intercepting

previously unknown signals. The ingenious intelligence plan to deceive the Germans about British radar development is a master stroke of deception.

While most of the book is devoted to electronic warfare in WW II, it does explain something of today's developments, many of which are understandably classified. The author has succeeded in making a complicated, highly technical subject fully understandable. The book should become a valuable reference work on the history of electronic warfare and also contribute to better understanding of the importance of electronic warfare as it applies to the modern battlefield.

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PANZERS AT WAR, by A. J. Barker, Charles Scribner's Sons, New York, 1978, 144 pages, \$14.95.

No war, other than the American Civil War, has attracted more laymen and serious student interest than World War II. No weapons system has been studied more or given rise to more myths than the Panzers of the Third Reich.

The author has compressed into 144 pages the development, testing, tactics, technical data, support vehicles, and commanders of these panzers from the early 1930's through the end of the war. Mr. Barker's approach of placing the development of the German armored fighting vehicles within the historical sequence of World War II makes easy reading, complemented by excellent photographs and technical descriptions sprinkled throughout the book.

Obviously the author's treatment of the Blitzkrieg into Poland, the assault on the West, the North African Campaigns, the Balkans, and the invasion of, and withdrawal from, Russia is a broad-brush of these complex operations. However, the descriptions of the major battles of these campaigns, punctuated liberally by quoted from high ranking commanders and anecdotes of

small-unit or individual actions provide a flow and spice which maintain reader interest.

The book is well illustrated with many interesting photographs of the machines and people under the difficult conditions of war and several maps which help show the magnitude of the operations described. The glossary provides complete data on the organization of all the Panzer and Panzer Grenadier units, complete with the unit symbols.

This book does not provide the serious student of World War II or of armored fighting vehicles with any new information other than the photographs, many of which have never been published outside Germany. However, the layman, the new student of military history, or anyone with a curiosity of spirit for mounted mobile combat and interest in the historical role of armor will find value in this book.

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COMMON SENSE TRAINING--A WORKING PHILOSOPHY FOR LEADERS, by LTG Arthur S. Collins Jr. (USA, Ret), Presidio Press, San Rafael, CA, 1978, 225 pages, \$11.95.

Most of us who have been in the Army for more than just a little while have been exposed first hand to, or at least heard about, General Collins' teachings on training. But regardless of the reader's previous exposure to the Collins' approach, there is plenty here for all of us to learn (or relearn, as appropriate) about our number one business of training our soldiers, both individually and collectively.

Sandwiched in between the splendid, adrenaline-churning Foreword by General Hamilton H. Howze (USA, Ret) and the two closing chapters titled "Advice for and about Generals" and "Fighting Qualities, National Will and Training," are 20 other pithy, stand-alone chapters addressing all facets of training in units, to include the leadership, the led, and the environment.

The author has two principal themes: Training is the Army's top priority today (and it has been sorely neglected); and the commander by his actions establishes the training atmosphere. He zeroes in on the battalion level and below and is soldier-oriented throughout. The reader will alternately laugh and cry. All too familiar conditions and situations are reviewed that dramatically underscore the author's conviction that there is a constancy regarding training fundamentals in spite of hardware or doctrinal changes.

There is something here for everyone--physical training, Reserve Component training, schedules, unit schools, standards, training management, barracks, maintenance, and crew/small/large unit training are but a few of the topics. His situational training ideas and his training tips will be especially helpful to our younger trainers. His quick review of the "X and Y" concept, prime time training, and the evils inherent in allowing a training NCO to be detailed at the company level should be thoroughly understood by the more senior people.

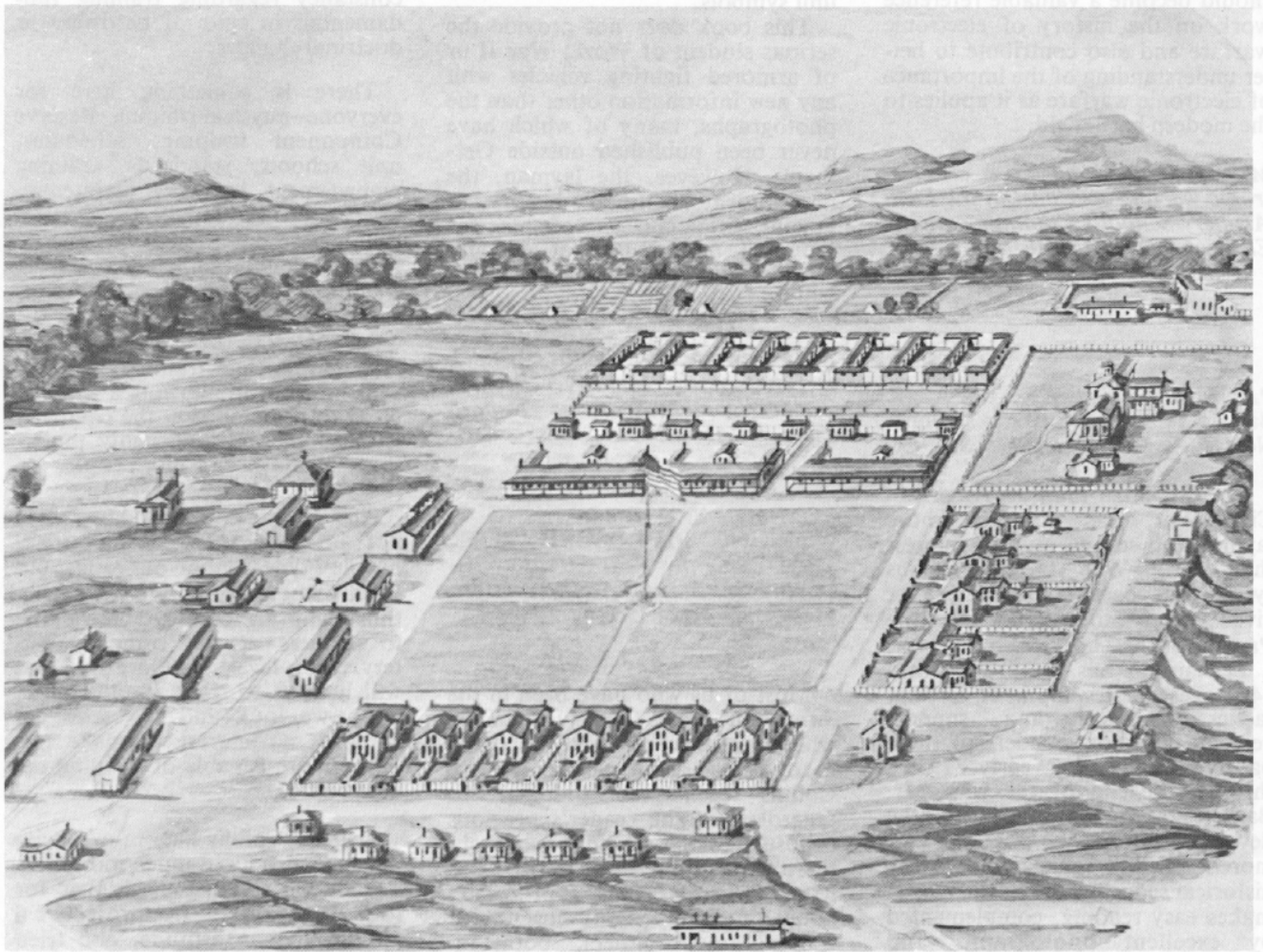
The messages in this book may not be received by the "pretty people" types among our ranks, but for the vast majority of our trainers--those who are comfortable talking to soldiers at the company/battery/troop level--there are tips that will help us to truly see and think when we look and to better act without self-interest to make our Army more capable of winning the land battle.

General Collins has, in a concise package, produced much more than a book on training techniques for today's Army. It projects a philosophy, an attitude, and tried and proven recipes, concerning healthy life at the small unit level that should be devoured by all of our officers and noncommissioned officers. Its complete understanding by all in the leadership and command business cannot help but be constructive for our Army.

*COL R. D. Hammond is currently serving as Director of Training Developments, USAFAS, Fort Sill, OK.*

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