

# FIELD ARTILLERY JOURNAL

January-February 1977



# FIELD ARTILLERY JOURNAL

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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 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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Key Gate surrounded by patches of commands represented at the Senior Field Artillery Commanders Conference. (Photo by Jimmy L. Hysaw, TASO, Fort Sill.)

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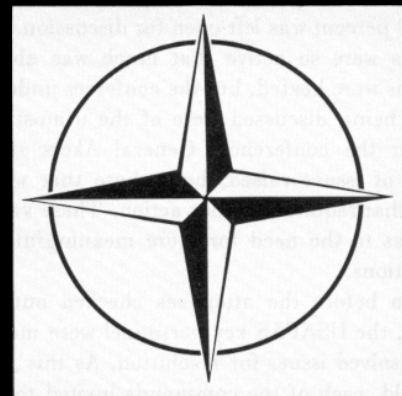
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# *Editor's Notes*

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## **Senior FA Commanders Conference**

Continuing a precedent set in December 1974, USAFAS hosted a conference for senior field artillery commanders from 19-21 October. Prior to the 1974 conference, there had not been such a meeting since 1946. Plans are to continue these invaluable face-to-face open discussions between the School and field commanders every two years.

Commanders of all field artillery div arties, groups and corps were invited and most attended or were represented. There has probably never been a gathering of such a quantity of FA experience and expertise in US history. (It is to this conference that our cover is devoted.)

MG Donald Keith opened the session by asking for a free exchange of candid comments and he attended many of the sessions. The Assistant Commandant, BG Albert Akers, was the ever-present moderator who kept the conference moving, often well past the scheduled end of the day. There were social hours in the evenings, but, from 0730 to 1730, it was strictly the serious business of fire support.

Several commanders presented briefings on activities within their commands — among them were V, VII and XVIII Corps Artilleries; 56th Brigade; 1st, 24th and 25th Division Artilleries; and, the 41st and 42d FA Groups. USAFAS presented summaries of major events taking place at the School and Center, as well as a look at the short-term and long-range future. Within each School presentation time block, 50 percent was "pitched" from the platform and 50 percent was left open for discussion. The discussion periods were so active that lunch was abbreviated. The sessions were heated, but the conferees understood that the issues being discussed were of the utmost importance.

After the conference, General Akers summarized the scores of issues raised, both those that were solved and those that required further action. These varied from TOE changes to the need for more meaningful nuclear surety inspections.

Even before the attendees checked out of their BOQ rooms, the USAFAS key personnel were meeting to divide the unsolved issues for resolution. As this *Journal* reaches the field, each of the commands invited to the conference will have received a summary of the points discussed and a second packet with subsequent actions taken by USAFAS to resolve issues. Here are just a few of the things discussed:

- How will the introduction of nonnuclear Lance impact on the prescribed nuclear load?
- How will the field artillery cope with ammunition resupply caused by the envisioned expenditures in a modern war in Europe?
- Is there a more meaningful way to evaluate the nuclear surety preparedness of a unit?

- What is the optimum basic load for the SP 155-mm weapon?
- What is the optimum basic load for the SP 155-mm weapon?
- What can be done to enhance the security of Lance units?
- What are the school training requirements for members of the FIST?
- What can be done to get improved FDC shelters for towed units?
- Should FA groups be attached to div arties or be given a reinforcing mission?
- What are the problems related to enlisted reclassification into MOS 17C?
- Is there a need for survey capability both in the target acquisition battery and in HHB of div arty?
- How can battalions get rid of obsolete M91 rocket launchers in their motor pools?

Most of the presentations were classified as they dealt with core issues affecting our plans to fight. Some were unclassified and a few of these will be presented in this and future issues of the *Journal*.

The conference was a truly interesting experience, and those of you who will be in command at the time of the next conference should let nothing stand in the way of your attendance.

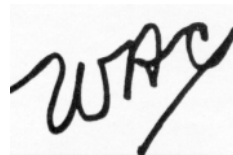
## **Direct Input**

Most of the data for the "Right By Piece" feature is obtained from unit newspapers. Figuring delays in receipt of newspapers and another delay in our writing to the unit for glossy photographs, we are somewhat behind the power curve. When your unit receives public affairs coverage, send the *Journal* a set of the photos direct. This will make our material more timely and preclude our possibly missing your item in the newspaper.

## **Staff Changes**

This will be the last issue for which Ms. Jackie Martin (nee Snyder) will be the Managing Editor. She has held this position since May 1974 and deserves a lion's share of the credit for making the revived *Journal* the quality publication it is. She is returning to school for her graduate degree. Another staff change that has not been reported earlier is the promotion of Ms. Elaine Henrion from Editorial Assistant to Circulation Manager/EA. Ms. Henrion has been with the *Journal* for 18 months.

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# *forward observations*

by MG Donald R. Keith

It is perhaps the dream of all artillerymen to one day walk out of Sherman House onto the Old Quadrangle to take command of Fort Sill and become the USAFAS Commandant. I am privileged to have done that and I am delighted to be here. It is now my job to fulfill the trust placed in me as the head of the worldwide US Field Artillery community.

I face a great challenge in two major areas. First, the field artillery is moving fast, on a tremendously broad front. This momentum must be continued. We have seldom, if ever, been in such a major transition, and the opportunities we have to do all the things that need doing will never be greater. It is up to all of us to insure that we take full advantage of the situation.

Second, I have some very large shoes to fill. It is more difficult to assume command of a vital, talented organization than to inherit one in obvious need of improvement. It is not particularly demanding to improve the bad, but it is very difficult to make the best even better. This we must do — together.

Looking forward to the months ahead, there are three things the Field Artillery must do:

- First, we are charged to complete our plan for fighting the "now" battle, whether it be in Europe, Asia or another area, and with the organizations and equipment on hand.
- Second, we are responsible for the conduct and management of a revolution on the battlefield — a revolution which will occur in the 1980s and will allow the Field Artillery to attack over-the-hill point and area targets with first-round fire-for-effect data every time. Along with this we will manage the entire fire support system with TACFIRE.
- Third, we must do these things in a new way. Our development processes can no longer be compartmented and piecemeal. We must learn to apply, within the limits of time, men and money assets, a total systems approach to all that we do. This requires development of doctrine, materiel, force structure and training *concurrently* as we move each new system into our inventory.

None of these tasks will be easy. I know, however, from my long kinship with the spirit of Saint Barbara, that these are things we can and will do. Just as we are accustomed to "team play" on the gunnery team, we must translate our team effort into an expanded combined arms team which extracts the last ounce of utility from every asset.

## **New Commandant**

Our new Commandant, MG Donald R. Keith, is fully on board and aggressively equipping himself for the job of being "Mr. Field Artillery." Fresh from four years of research, development and acquisition in Washington, he is fully aware of the massive materiel changes on the field artillery horizon. As a career artilleryman he is acutely aware of our perennial problems in maintaining our personnel strengths. General Keith fully supports the doctrinal trends underway within TRADOC and the Field Artillery Community.

General Keith graduated from West Point in 1949 and, therefore, is the first commandant since World War II that did not fight in that war. He commanded a battery at Fort Bliss, a Sergeant missile battalion in Europe and the 36th Field Artillery Group. General Keith taught at the Military Academy and is a graduate of the Army Command and General Staff College, the Armed Forces Staff College, the Industrial College of the Armed Forces and Columbia University where he received a Master of Arts degree.

His decorations include the Legion of Merit with two oak leaf clusters, the Bronze Star and the Meritorious Service Medal. —Ed.



**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***

**Library Needs Help**

The Morris Swett Library, USAFAS, is striving to enrich its collection, particularly in the area of the history of US and foreign field artillery. Especially desired are early works long since out of print, such as handbooks, treatises, etc.

Anyone having material to donate, or having knowledge of another person who might, should contact Mr. James Byrn, Supervisory Librarian, at AC 405-351-4525 (AV 639-4525) or write to:

Morris Swett Library  
USAFAS  
Fort Sill, OK 73503

**M100 Pantel Errors**

I have a solution to the problem of accidental use of the 3200 mil counter-reset knob on the M100 series panoramic telescope.

After "end of mission," the gunner using the M100 series pantel should set the azimuth counter to 3200, using the azimuth counter knob and then traverse the weapon back to his aiming point. However, inexperienced gunners sometimes push in the 3200-mil counter-reset knob and rotate it until 3200 is showing on the reset counter. They then are out of lay by the number of mils away from 3200 on the previous mission.

To solve this problem, a medium-sized cotter key could be attached with a small chain to the left side of the pantel in the vicinity of the 3200-mil counter-reset knob. Painting the cotter key red would attract attention.

After the weapon has been laid for direction and all aiming points are established and recorded, the gunner would be instructed to slip the cotter key under the reset knob and over the shaft. This would make it impossible to reset the reset counter scale to 3200 without removing the cotter key from the shaft. The gunner would still be able to counter-reset when necessary (such as

when changing aiming points) by removing the cotter key, pushing in and rotating the counter-reset knob.

This would be a cheap and simple method of preventing future errors with the M100 telescope.

David P. Wood  
SFC  
USA, MTT  
Saudi Arabia

**FIST And T/RP At Work**

Recently there has been a lot of editorial comment on the fire support team (FIST). The target/reference point (T/RP) system has also been the topic of some discussion.

To the best of my knowledge, the 82d Airborne Division is the only division in the Army which has adopted both.

I wrote the following guide for the 2d Brigade. There probably will be modifications to both of these innovations, but this is what the 82d uses *now*. FIST personnel have already transferred from the infantry mortar platoons to the artillery batteries. T/RPs are used by artillery and infantry alike.

The organization of the 82d's FIST headquarters is a lieutenant FIST chief, an E6 fire support sergeant, an E5 assistant fire support sergeant and two E3 radio operators at maneuver company level. An FO party (an E5 FO and an E4 radio operator) is with each of the company's three platoons.

Although each FIST headquarters has the ability to "split" and provide an additional FO party, this would greatly degrade the FIST's ability to coordinate fires.

The FISTs operate in these radio nets:

- Platoon FO: 81-mm mortar net.
- Company FIST: 81-mm mortar and artillery battery fire direction center (FDC) nets.
- Battalion fire support officer (FSO):

Battery FDC, 4.2-inch mortar and fire coordination nets.

- Battery FDC: Its fire direction and command nets and the fire coordination net.
- 4.2-inch mortar: Its fire and command nets and the fire coordination net.
- Brigade FSO: Artillery battalion command, fire coordination and division fire support element nets.

As indicated, the FO parties with each maneuver platoon net directly with the company's 81-mm mortar FDC. The FIST headquarters monitors both the 81-mm mortar net and the artillery battery fire net. Should more than 81-mm fire be required, the platoon's FO can request these fires through FIST headquarters. Put another way:

Fire Unit	Plans Fires	Requests Fires
81-mm	FIST Hq	Platoon FO
DS arty	Bn FSO	FIST Hq
4.2-inch	Bn FSO	Bn FSO

The maneuver battalion commander may wish to weight a company's area by assigning priority of 4.2-inch mortar fires to that company. In this situation, one or more platoon FO parties may be told by the FIST chief to enter the heavy mortar net.

Coordination of fire support is accomplished through a new net, the fire coordination net. Additionally, external fire support such as tactical air and attack helicopters can be requested/-coordinated on this net. This new net is being added to the division communications-electronics operation instructions (CEOI) but, in the interim, we are using the direct support battalion retransmission net. The new CEOI will also include call signs for the platoon FOs.

The division uses the T/RP system for both maneuver control and fire support. A T/RP is a designated location, preferably a prominent terrain

feature. It provides a common system for all arms and services, simple enough to be remembered and used by the average soldier. There will be no duplication within a division.

A T/RP consists of two letters and three numbers. The first letter is assigned by corps and the second letter is assigned by division. Each major maneuver and fire support unit is given its own divisional letter. The numerical assignment goes down to platoon level. For example:

- C—A T/RP of the 82d Airborne Division.
- CD—3d Brigade, 82d Airborne. (The brigade has 999 discrete T/RPs.)
- CD1—A specific battalion within the 3d Brigade. (Each battalion has 200 of the brigade's 999 T/RPs.)
- CD13—A specific company within a battalion of the 3d Brigade. (Each company has 50 of the battalion's 200 T/RPs.)
- CD139—A specific platoon within the above command structure *and* a definite location on the ground. (Each platoon has 10 T/RPs.)

A similar system applies to artillery units and fire planners at various command levels. An advantage of this system is that the T/RP described (CD139) would be identified that way only at corps. An 81-mm mortar FO could identify this point to his FDC as simply "T/RP 39."

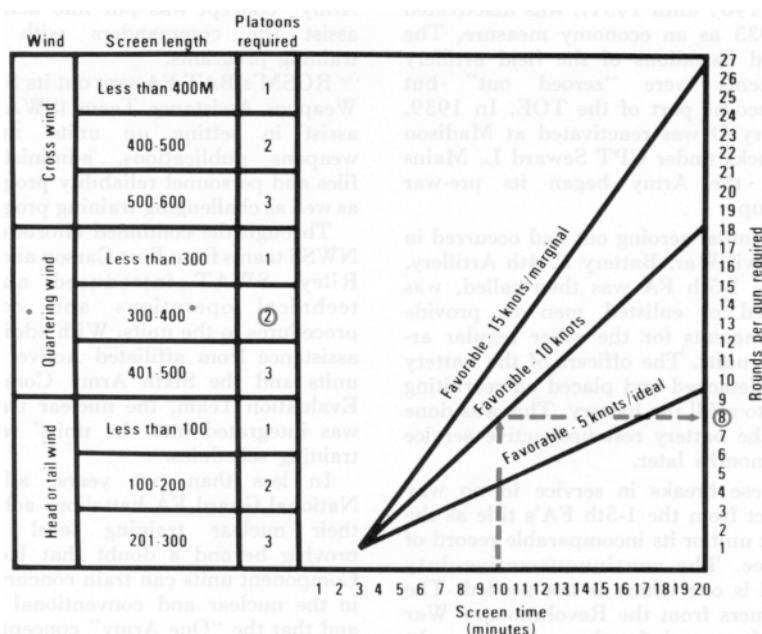
Within our system, we try to limit T/RP assignments to one per grid square. Platoon FOs record only T/RPs they can see within 3,000 meters. Company FISTs can mapspot T/RPs out to 5,000 meters. Battalion FSOs can designate T/RPs to any range necessary to accomplish the mission.

Burt A. VanderClute II  
CPT, FA  
1-320th Field Artillery

**Correction**

*The November-December Journal "Incoming" carried a list of bibliographies prepared by Morris Swett Library. These bibliographies are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 and not from the DDC as previously noted.—Ed.*

**Quicksmoke 155-mm HC**



**Smoke Graph**

It is encouraging to see that the Field Artillery School is enthusiastically addressing the effective use of smoke by both the forward observer and the fire direction center. More often than not smoke on the modern battlefield will be required for suppression or obscuration; time for lengthy computations or discussion will seldom be available.

Training Circular 6-20-5, *Field Artillery Smoke*, describes the procedures necessary to compute the rounds per gun for a particular mission. The parameters the gunnery team must address include:

- size of the area to be screened
- length of time the screen is required;
- wind speed;
- atmospheric conditions;
- type of smoke to be fired (HC or WP);
- caliber of weapon; and,
- number of guns to fire.

An FO or FDC computer unfamiliar with quick smoke procedures must check the various tables in the TC to obtain a meaningful solution.

A graph of the type illustrated presents the same information for a given caliber and shell as the TC, but in simpler fashion. The left portion of the chart derives the number of platoons to fire; and, the right portion determines

the appropriate number of rounds per gun from the wind speed, screen time and atmospheric conditions.

Consider this example problem: *Screen a 400-meter front for 10 minutes, atmospheric conditions favorable, wind speed 10 knots, quarterming.*

The graph indicates that two platoons are needed, with eight rounds per gun necessary to provide the required smoke.

The procedure for construction of the simple graph is obvious to any fire direction officer. A similar graph for 105-mm or for shell white phosphorous should it be necessary. Pocket cards presenting this information will enhance significantly the responsiveness of artillery smoke.

Robert A. Strong  
CPT, FA  
Lawton, OK

**Oldest Unit**

I have noted an error in your November-December 1976 issue. In the item "Oldest Unit — It's Official" ["Right By Piece"], it is stated that the 1st Battalion, 5th Field Artillery, is the only unit which has been on continuous active duty since the Revolutionary War. This is not correct.

## Incoming

The 1-5th FA, in the form of Battery D, 5th Field Artillery (as it was known from 1907 until 1957), was inactivated in 1933 as an economy measure. The second battalions of the field artillery regiments were "zeroed out" but retained as part of the TOE. In 1939, Battery D was reactivated at Madison Barracks under CPT Seward L. Mains when the Army began its pre-war buildup.

A similar zeroing out had occurred in the Civil War. Battery F, 4th Artillery, as the 1-5th FA was then called, was drained of enlisted men to provide replacements for the other regular artillery units. The officers of the battery were detached and placed on recruiting duty to refill the battery. This was done and the battery resumed active service two months later.

These breaks in service in no way detract from the 1-5th FA's title as the oldest unit or its incomparable record of service. The continuous-active-duty laurel is one which is not needed. The streamers from the Revolutionary War and after speak for themselves. I ought to know. I was unit historian of the Alexander Hamtton Battery for two years.

John M. Manguso  
CPT, USAR  
Gainesville, FL

### **"One Army" In Sixth Army**

On the weekend of 18-19 September 1976, the 1st Battalion, 127th Field Artillery Battalion (155-mm, SP), Kansas National Guard, achieved its nuclear training level goals with the aid of personnel from the Readiness Group Schilling Manor (RGSM), Salina, KS; the Nuclear Weapon Support Section (NWSS), Fort Riley, KS; and, the Sixth Army Command Evaluation Team.

This was the last of the five National Guard field artillery battalions in the Readiness Group's four-state area successfully to pass the Sixth Army Command Evaluation. This achievement makes RGSM the first in the Sixth Army to have all of the Reserve Component FA battalions in its area reach the nuclear training goals.

In 1974 the RGSM's Branch Assistance Team, Field Artillery (BAT-FA), visited all five battalion commanders and gave extensive classes to introduce nuclear weapon training, assuring them that with all the available resources of the "One Army" concept, the units could meet the challenge. After the commanders accepted the challenge

of nuclear weapon training, the "One Army" concept was put into action to assist the commanders with their training programs.

RGSM's BAT-FA sent out its Special Weapons Assistance Team (SWAT) to assist in setting up units' nuclear weapons publications, administrative files and personnel reliability programs, as well as challenging training programs.

Through the combined efforts of the NWSS teams from Fort Carson and Fort Riley, SWAT introduced nuclear technical operations and convoy procedures to the units. With additional assistance from affiliated Active Army units and the Sixth Army Command Evaluation Team, the nuclear training was integrated into the units' regular training schedules.

In less than two years, all five National Guard FA battalions achieved their nuclear training level goals, proving beyond a doubt that Reserve Component units can train concurrently in the nuclear and conventional fields and that the "One Army" concept does work!

Anthony Curtis  
Major, FA  
Readiness Group Schilling  
Manor  
Salina, KS

### **More On FA Groups**

I would like to see the *Journal* carry more tactical thinking. For example, the USAR-NG field artillery battalions are organized into groups and will likely be used this way in mobilization, but there is very little information available on the operation and employment of field artillery groups.

I look to the *Journal* to keep me updated on the latest in artillery weapons and tactics.

Charles W. Lee  
LTC, USAR  
Birmingham, AL

*Thank you for your comments. There is an open invitation for any of our seven Active Army FA group commanders to send the **Journal** their comments and thoughts on the operation of their command structure and operations and suggested improvements. With the elimination of corps artillery commands and the employment of artillery groups under div arty control, the role of the group commander will change significantly.—Ed.*

## **New TAB**

Battery H (Target Acquisition), 29th Field Artillery, was activated 21 June 1976, at the 4th Infantry Division (Mechanized), Fort Carson, CO, and immediately began a carefully planned build-up which is calculated to have the battery fully operational by the third quarter of FY 77. Criterion for the growth of the battery is a phased development with continuous reassignment and use of assigned assets, reassignments within 4th Infantry Division and minimum turbulence within 4th Div Arty due to lateral transfer of personnel and equipment.

The build-up of the target acquisition battery (TAB) has been made more challenging by two other major undertakings within the 4th Infantry Division Artillery: "Reprstrain" and "Brigade 76-II." Despite these distractors, Battery H activation progressed smoothly and has developed to a point where it furnishes all radar support and some survey support to the division artillery battalions. Additionally, during a recent division CPX, the battery was able to field a processing section for the div arty tactical operations center.

One of the peculiarities of the battery TOE is the lack of organic motor maintenance capability. This is critical, since the proposed augmentation of wheeled vehicle maintenance personnel (MOS 63B) to support the TAB's additional 69 pieces of rolling stock (vehicles and trailers) is not yet authorized. The organizational maintenance requirements also present a problem in coordination an scheduling, particularly within the area of real estate; i.e., bays to work in and a secure vehicle park. These are internal problems which must be corrected in-house and probably will be accomplished differently within each division.

Also, the lack of battery communications personnel and the additional training of the separate sections, such as wiremen and radio repairmen, will be a problem.

Many of the problem areas could be eased by adding supervisors with the wheeled vehicle MOS (63B) and communications MOS (31G) to the TAB TOE.

An additional overall problem is the time frame of MTOE changes to losing and gaining units. Expeditious and timely MTOE changes (i.e., the effective



MTOE change dates be the same for *all* affected units) would alleviate this.

These are a few things that the Field Artillery School can do for the activating TAB units that will help smooth the way. One would be to notify TAB units as early as possible of the number of students in MOSs 17C, 17B and 82C scheduled for assignment to various TAB units. Another area would be for the Field Artillery School to staff reference notes through the existing TABs prior to their use by the School. I feel that comments from user units would add immeasurably to the instructional materials used by the school.

A full-length article on our experiences with the target acquisition battery and the counterfire program will be submitted to the *Field Artillery Journal* soon.

Frank E. Keeser  
CW4  
Battery H (TA), 29th FA  
Fort Carson, CO

*Your comments are appreciated and have been shared with the School. The Journal hopes to be a source of valuable "lessons learned" as the first three TABs join their div arty.—Ed.*

### **Better Tactical Missions?**

In 338 BC, Phillip of Macedonia used a new battle tactic to defeat the Grecian forces opposing him at Chaeronea. The tactic he used enabled his son Alexander to conquer much of the then known world.

Phillip's tactic is called "hammer and anvil" and was designed to use his massed infantry to "fix" the enemy, then the cavalry would sweep around the enemy and strike his rear, "destroying" him.

On the mid-intensity battlefield, we also seek to fix and destroy the enemy. Today, however, a simplistic comparison would show that the maneuver forces fix the enemy and the fire support arms destroy the enemy. (The hammer in this case comes from the air, rather than from the rear.) This concept, at division and lower levels, can be expanded.

An examination of the modern battlefield leads to the realization that several arms act as fixers and destroyers on the battlefield and that good coordination is the key to maximizing economy-of-force, allowing successful contacts with the enemy.

There is one type of battle in which the maneuver forces seldom become involved. Artillery duels and counterfire are the result of the technological advances which allow opposing artillery forces to see each other. Thus, certain "combat support" forces are indeed combat units which fix and destroy as much or more than the maneuver forces.

Are the fire support arms indeed supporting the maneuver arms? Are they, or should they be, doing something more? This subordination of indirect fire units to the mission of fire support leads to a mental block which is difficult, if not impossible, to overcome. This is exhibited in the form of having to "sell" the product (instead of coordinating), waiting for targets designated by commanders and being dependent on the maneuver forces for the operation plans.

Now let us suppose that the mission of direct support were rewritten to be direct coordination. This change stresses coordination and teamwork and allows the artillery unit to concentrate on fixing and destroying the enemy's maneuver and indirect fire forces. Direct coordination is more than just a change in names or a matter of semantics. It constitutes a change in philosophy which the maneuver arms have experienced since the 1973 Mideast war. As that philosophy was engendered by advances in weapons technology and a refocusing of the military mission on the mid-intensity battlefield, so also must the artillery's philosophy be matched to these factors.

Consideration should now be given to how this would actually work in practice. The artillery battalion commander will be responsible to the division artillery commander. The division artillery commander will be concerned with the tactical employment of his units. A mission will be given the artillery battalion commander by the div arty commander, which will parallel the maneuver forces mission — offense, defense, withdrawal, etc. Inherent in the execution of this mission will be direct coordination (DC), general coordination (GC), GCR or reinforcing. Other aspects of the execution of the mission include pursuit of an aggressive or defensive counterfire posture, movement techniques, etc.

In the execution of the DC responsibilities the battalion commander will dispatch his FSOs (LNOs) and FOs to the brigades, battalions and companies to *coordinate* directly with the maneuver

elements. The brigade boundaries will serve as the boundaries for the artillery battalion, but will not subordinate the artillery battalion to the brigade. (The artillery battalion subordination is to div arty.) In this manner, a mission of offense or defense assumes a new meaning, where maneuver is only one element.

Many a maneuver force commander will be concerned about a loss or degradation of fires to assist him on the battlefield. Both the infantry and armor force commanders have their own organic fire support, which will now be *the* fire support. This redefinition of missions will result in no less responsive artillery fires; in fact, *quality* will be the rule because the artillery units will now be expected to step out and be energetic in pursuit of their missions, instead of being dependent on another staff for their missions and approval of their actions. Instead of supporting, the artillery will have a mission which will require rigorous and thorough tactical thinking and planning and aggressive execution.

The redesignation of roles will allow artillery and division commanders to maximize their combat power, through an efficient combination of maneuver and firepower. The new missions will allow the artillery to plan and execute greater surprise, economy-of-force and massing on the mid-intensity battlefield, enhancing the overall mission of the division, div arty, brigade and battalion forces.

Charles E. Frost Jr.  
CPT, FA  
1-35th FA

### **"22d PW/CIIC—FIRE!"**

Fort George G. Meade, MD, boasts a one of a kind unit: a 105-mm towed howitzer salute battery commanded by a female officer and assigned to a Strategic Army Forces (STRAF) military police battalion. Additionally, the battery XO is a military intelligence officer, while cannoners consist of Chinese, Arabic and Laotian linguists.

The commander of this unique artillery battery is ILT Mary A. Maier. As a military police officer, she found her job challenging when assigned to command the 22d US Prisoner of War/Civilian Internee Information Center since this unit is the only one of its kind on the Active Army rolls. The 22d's primary mission is "to provide a general agency in a theater of operations

## Incoming

for the receipt, processing, maintenance and transmittal of records and reports required by the Geneva Convention . . . relative to the treatment of prisoners of war and the protection of civilian persons in time of war."

However, it is the unit's additional duty as the salute battery in support of Fort Meade (an installation that houses First US Army, the National Security Agency, the US Army Intelligence Agency, Army Readiness Region III and a number of other military units and organizations) that adds an unusual dimension to the unit's mission. The 22d picked up its artillery mission when the last element of the 6th Armored Cavalry Regiment departed Fort Meade in June 1973.

The 22d US PW/CIIC is attached to the 519th Military Police Battalion, one of the Army's five STRAF MP battalions. Thus, in addition to maintaining a military police battalion in a constant state of readiness, the battalion commander must also insure the readiness of the artillery asset, the 22d Salute Battery (Prisoner of War).

No matter how disjointed the operation sounds, the 22d Salute Battery has performed with distinction since firing its first salute in November 1973 to honor the US Marine Corps during its anniversary celebration. Salutes to honor appropriate national holidays and to support other armed services such as the US Naval Academy are fired as part of the Fort Meade mission.

The proficiency of the 22d's group of linguists, MPs and clerks is such that potentially calamitous events are handled as a matter of course. During a recent salute fired in honor of retiring John S. Wieringa Jr. (a distinguished field artilleryman), a misfire was "picked up" without the slightest hesitation.

Clyde H. Patterson Jr.  
COL, AR  
Commander  
Fort Meade, MD

### **Dispelling FA Math Myth**

All FA officers assigned to ROTC instructor duty have been encouraged to dispell the impression that ROTC cadets must be math wizards to become artillery officers. Last summer, as an ROTC Advanced Camp instructor at Fort Riley, KS, I participated in a program which made a significant contribution to the demise of the artillery "math myth." The program was important

to me because the cadets would, upon return to their respective campuses, make their branch preferences known to DA. This was the last opportunity for the Army branches to impress these cadets. I saw in action some of the finest FA officers I have ever met. The basic "philosophy of instruction" was to present our instruction so the cadets would be immediately involved in the actual performance of basic artillery procedures. This was done by coordinating three separate classes into the gunnery team. The cadets did it all — to include computing firing data and actually firing the howitzers. It was not our intent to have the cadets become proficient in the solution of the gunnery problem but merely to involve them in its solution. Comments made after the FA classes indicated that the artillery had made significant additions to the ranks of Redlegs.

The FA program received the wholehearted support of the 1st Battalion, 5th Field Artillery, commanded by LTC Leonard A. Easom. The battalion's dedication to the mission, supported by many hours of preparation and a "can do" attitude, was instrumental in our favorable impression.

A second significant contribution was made by the USAFAS Tactics/Combined Arms Department. The department provided the instructors a detailed briefing on the latest FA tactics and doctrine. Thus, the instructors were able to provide the most current training available.

The artillery program also included a demonstration of the Artillery Half Section from Fort Sill and the bicentennial

presentation of Alexander Hamilton's Delta Battery, 1-5th FA. These events accentuated the tradition of the artillery.

The instructors were from universities and colleges from New Mexico to Michigan with enrollments of 35,000 students to little more than 1,000. These professionals formed into a cohesive FA team in a very brief period of time and had a professional program formed when the cadets arrived.

I think a significant lesson that all artillerymen can take from this experience is that it behooves us to insure that those on ROTC duty be kept abreast of current branch philosophies. We must insure that those people who influence ROTC cadets or officer candidates are not deluded by the math myth. The sooner we do so, the easier it will be for us to attract highly qualified young men into the Field Artillery Branch. (One item that may be helpful in this area for ROTC cadets and fellow officers is the recently produced TEC tape from Fort Sill entitled "The FA Is Now." This tape is being used effectively in the University of Illinois program during classes that introduce the various branches to the cadets.)

Our success at Fort Riley this summer has yet to be measured — the success will be determined when these cadets make their branch preferences known to DA.

Keith E. Predmore  
MAJ, FA  
Army ROTC Instructor Gp  
University of Illinois  
Champaign, IL

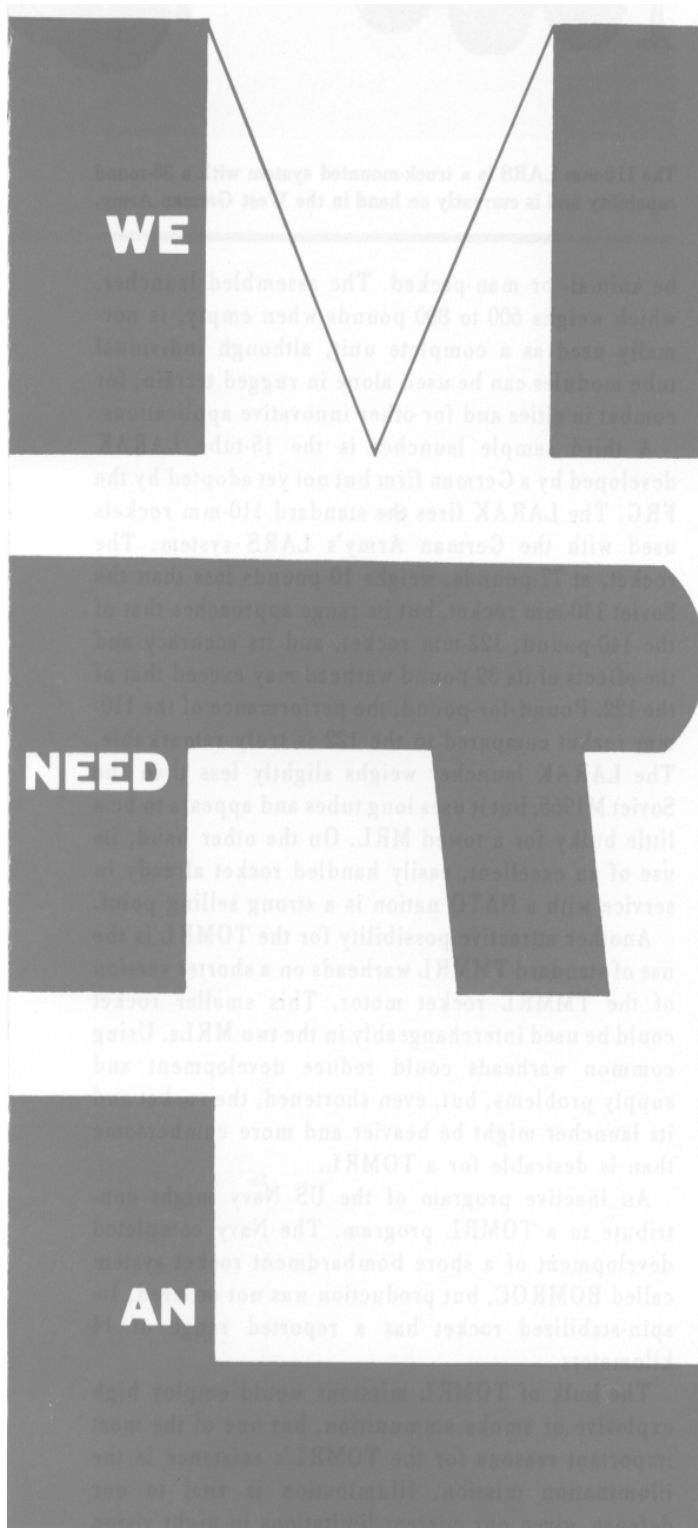


**The forward observer arrives on the scene in his own version of an FO vehicle. His driver is a young lady, demonstrating our willingness to have females in the Branch. In the rear, a howitzer prepares for a high angle/low angle demonstration at Fort Riley.**

## Part II

# An Airman's View

by LTC W. H. Rees, USAF



The American soldier has proved himself a versatile, flexible individual equally at home on the automated battlefield or in primeval jungle. It follows naturally that his multiple rocket launcher (MRL) system should be equally versatile and flexible.

Since he faces a multitude of unpredictable combat situations, he needs two types of launchers:

- A self-propelled, main-battle launcher for general support.
- A relatively inexpensive, towed launcher for direct support.

The two launchers should retain the basic simplicity of contemporary MRLs, but they should also be equipped with full remote control capabilities and supplied with several special-purpose rocket warheads.

The remoting system would control deflection, quadrant elevation, time fuses and rocket firing. It would link with computerized fire control systems such as TACFIRE as well as with compact digital entry devices operated by battery or section personnel. Operating under the direct control of TACFIRE, MRLs could fire quickly and accurately on targets pinpointed by such sophisticated means as Army Security Agency, radars, unattended ground sensors and laser rangefinders. When necessary, the remoting system could be bypassed partially or entirely.

With a variety of MRL warheads, fire planners would have many new options. They could supplement cannon fires, substitute MRLs when cannon or tactical air are otherwise committed or unavailable and use MRLs for missions that would detract from the primary role of cannon or that might expose cannon to undue hazards (illumination is one example). And, they could use MRLs for some tasks which cannon cannot perform at all.

Remote control capability and a prudent selection of warheads would enable an MRL system to take its place alongside the most sophisticated weapons on the battlefield. A closer examination of the uniquely American MRL, beginning with the launchers and their basic ammunition, follows.

### Truck-Mounted MRL (TMMRL)

The proposed workhorse MRL consists of a launcher similar to the Soviet BM-21, mounted on a standard truck chassis. The BM-21 is one of the best MRLs in service today. The German (FRG) Army also has an excellent MRL, the 110-mm Light Artillery Rocket System (LARS). LARS is comparable and in some ways superior to the BM-21, except that the relatively small rocket and its launcher may have less growth potential. Whatever the pattern, the TMMRL launcher could

easily be mounted on an armored personnel carrier, but truck mounting would hold down program costs, increase reliability and provide better highway speeds in Western Europe where the road network is dense and where rapid reinforcing may be necessary. The general characteristics of the TMMRL are those already discussed in Part I (November-December 1976 *FA Journal*) under "Useful MRL Characteristics." Additional capabilities and applications will be discussed in later sections dealing with warheads and remote controls.

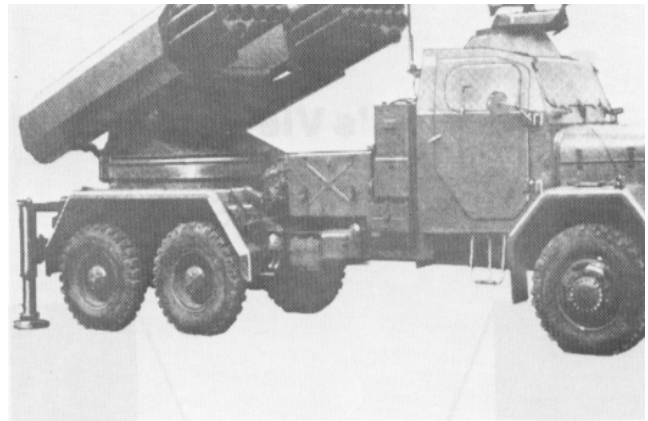
A suitable rocket may already be available for our TMMRL. The US Navy has long used the five-inch Zuni rocket on tactical aircraft. In 1975, 78 improved Zuni rockets were test fired from ground-mounted launch tubes, and the results indicated that the rocket is comparable to the Soviet 122-mm rocket. Although the complete rocket is slightly shorter and lighter than the 122, its sophisticated warhead, at 65 pounds, is about 50 percent heavier. The rocket has a range of about 16 kilometers which can be extended to 20 kilometers. During one full day of firing tests without meteorological (Met) updates, the rocket displayed a probable deflection error of eight mils and, at maximum range, a probable range error of less than three mils (the *greatest* range error was 150 meters). There are now three Zuni rocket motors and a variety of warheads, most of which have been produced and stockpiled in quantity. All Zuni rocket motors, warheads and launch tubes are interchangeable.

### **Towed MRL (TOMRL)**

A second MRL, relatively cheap and towed, is needed for direct support of maneuver units, airborne/airmobile operations and for the really dirty jobs — missions that require an artillery weapon to stand fast in the face of probable enemy counterfire. Existing launchers and rockets offer examples of several different approaches to satisfying a TOMRL requirement.

The Soviet TOMRL, known as the M1965 or sometimes as the RPU-14, fires sixteen 140-mm spin-stabilized rockets to a range of 9.8 kilometers. The complete rocket weighs 87 pounds with a 40-pound warhead. The empty launcher weighs about 4,000 pounds.

The Chinese Communist 107-mm Type 63 or Type 63-1 has a very versatile launcher design, but marginally effective ammunition. The rocket weighs about 42 pounds, with an 18.5-pound warhead, and has a maximum range of eight kilometers. The 12-tube launchers easily break down into two-, three- or four-tube modules, plus other "building blocks" which can



**The 110-mm LARS is a truck-mounted system with a 36-round capability and is currently on hand in the West German Army.**

be animal- or man-packed. The assembled launcher, which weighs 600 to 800 pounds when empty, is normally used as a complete unit, although individual tube modules can be used alone in rugged terrain, for combat in cities and for other innovative applications.

A third sample launcher is the 15-tube LARAK developed by a German firm but not yet adopted by the FRG. The LARAK fires the standard 110-mm rockets used with the German Army's LARS system. The rocket, at 77 pounds, weighs 10 pounds less than the Soviet 140-mm rocket, but its range approaches that of the 140-pound, 122-mm rocket, and its accuracy and the effects of its 39-pound warhead may exceed that of the 122. Pound-for-pound, the performance of the 110-mm rocket compared to the 122 is truly remarkable. The LARAK launcher weighs slightly less than the Soviet M1965, but it uses long tubes and appears to be a little bulky for a towed MRL. On the other hand, its use of an excellent, easily handled rocket already in service with a NATO nation is a strong selling point.

Another attractive possibility for the TOMRL is the use of standard TMMRL warheads on a shorter version of the TMMRL rocket motor. This smaller rocket could be used interchangeably in the two MRLs. Using common warheads could reduce development and supply problems, but, even shortened, the rocket and its launcher might be heavier and more cumbersome than is desirable for a TOMRL.

An inactive program of the US Navy might contribute to a TOMRL program. The Navy completed development of a shore bombardment rocket system called BOMROC, but production was not ordered. Its spin-stabilized rocket has a reported range of 14 kilometers.

The bulk of TOMRL missions would employ high explosive or smoke ammunition, but one of the most important reasons for the TOMRL's existence is the illumination mission. Illumination is vital to our defense, given our current limitations in night vision

equipment and the excellent night capability of the potential opposition; however, sustained illumination requires repeated shots at brief, predictable intervals. Is there an easier challenge to enemy target acquisition and counterfire units? How long can a cannon battery afford to stand its ground in order to fire an urgent illumination mission? Let a more expendable TOMRL do the job!

After setting a TOMRL up for illumination, its crew would normally retire to a safe area while the fire direction center (FDC) or fire support officer (FSO) operated the launcher by remote control. Depending on flare burn time and overlap, six 16-tube launchers could provide from 40 to 90 minutes of continuous illumination without reloading — a long time when facing a massed attack at night. Naturally, commanders would expect enemy counterfire against an illuminating TOMRL; so they could cover the TOMRL with target acquisition radars and prepare to return accurate counterfire. In this sense, the TOMRL would serve additional duty as a target acquisition device. A TOMRL unit should have a double complement of launchers to allow for expected attrition and to permit crews to wait out the counterfire threat before they retrieve or reload expended launchers.

A six-section battery with 12 launchers would have great operating flexibility. It could set up individual launchers for dedicated missions and emplace extra launchers in depth on a fallback position; mass six launchers for manned operations while dispersing the remainder for remote control missions; or, mass all 12 for a single preplanned salvo. Besides illumination, the TOMRL battery could provide countermortar, preparation, spoiling or immediate suppression fires, and medium- to long-range defense of static positions. TOMRLs could also provide short-range, direct fires under the positive remote control of a forward observer (FO). In a terminal role, discarded launcher tubes could even be rigged into automatic ambushes for enemy vehicles.

## Warhead Types

The basic purpose of an MRL is massed delivery of high explosives. A few MRL systems, however, have smoke, chemical or leaflet shells. Because of low launch stresses and easy access to loaded rockets for electrical connections, a variety of other warheads could easily be designed for a modern MRL system. With some of these warheads, MRLs would not employ massed fire. With others, the effectiveness of massed fires would be greatly enhanced.

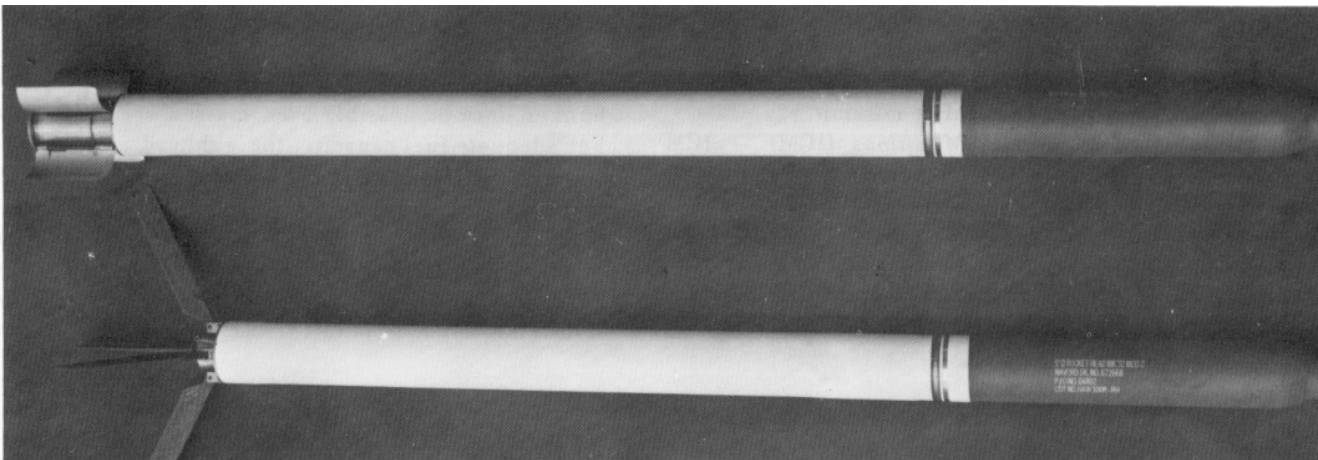
*High Explosive* — High explosive fragmentation warheads would be employed against the majority of targets.

*High Explosive Dual Purpose (HEDP)* — This warhead's operating principle is similar to that of the dual-mode, 40-mm grenade (M433 HEDP) or to the bomblets contained in the Rockeye cluster bomb unit munition. Each has an armor-piercing shaped charge in front, backed by a fragmentation charge. The M433 HEDP grenade always functions in both modes, whereas the Rockeye bomblet functions in the armor-piercing mode when it strikes a very hard material, such as steel, or in the fragmentation mode when it impacts a softer substance, such as earth. A dualpurpose warhead would cost more than a simple high explosive warhead, and it might sacrifice some fragmentation and blast effect, but it would guarantee penetration of any armor it might hit. This HEDP warhead would be a good compromise choice for many targets. A standard 45-pound warhead for the Navy Zuni rocket has combined blast, fragmentation and shaped-charge effects.

*Smoke* — The MRL would provide an excellent means to build up initial smoke coverage quickly over large areas. Cannon might have to fill in some gaps and handle the replenishment task, especially when supported troops close with the enemy. In the air defense suppression role, smoke can blind SA-7 and SA-9 surface-to-air missiles (SAMs) and the optical tracking sections of SA-6, SA-8 and ZSU-23-4 fire

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The US Navy's 5-inch Zuni rocket is current armament for tactical aircraft and a possible projectile for an Army MRL.



control systems. In this application even a widespread "polka-dot" type coverage would provide low-flying aircraft with significant protection because individual smoke clouds will delay a gunner's visual acquisition and interrupt his tracking.

*Illumination* — See "Towed MRL" and "Remote Controls."

*Chaff* — Radar reflective chaff is an electronic countermeasure (ECM) used to confuse SAM and anti-aircraft (AA) radars and their operators. A false target appears on the enemy radar scope with each burst of chaff, but the effect varies with the type of radar, the operator's competence and the quantity and distribution of the chaff. For instance, the radar fire control system of the otherwise effective ZSU-23-4 AA gun is said to be particularly vulnerable to chaff.

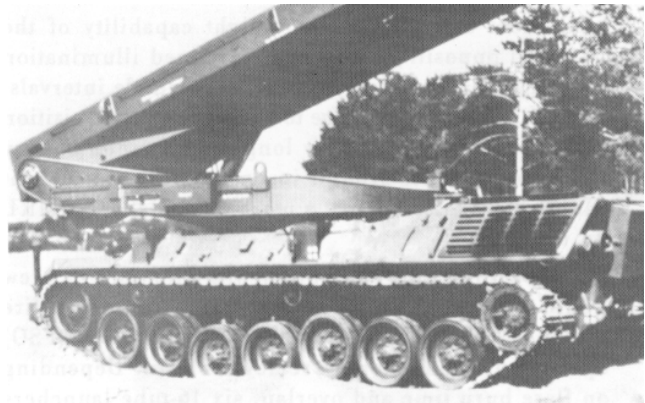
A rocket warhead can carry at least 10 and as many as 200 chaff bundles, depending on bundle size. Assume that a single TMMRL fired 40 chaff shells, each of which dispensed 10 bundles at 500-meter intervals beginning at a range of 5,000 meters, and assume that the launcher traversed one degree between each shot. During a 20-second period, 400 false targets would appear in an area about five kilometers long and an average of five kilometers wide. Within this area, there would be an average of one chaff target in every 250-meter square block of airspace along the plane of the rockets' trajectories. Airstrikes executed immediately after the chaff blossomed would receive significant protection from radar-directed air defenses.

Radar operators would usually try to work through the chaff and would sometimes succeed, but at best they would take more time to fire. As a result, they would have to keep their radars on the air longer than normal, increasing their exposure to anti-radar missiles or to location by our intelligence elements. Secondly, even brief acquisition or tracking delays would often enable high-speed aircraft to escape the air defense weapon's effective engagement envelope before the weapon could fire. Chaff-filled artillery shells were used during the 1973 Mideast War, and the US Navy has an operational chaff rocket based on the Zuni system.

*Chemical and Leaflet* — These missions require volume fire and dispersion, ideal tasks for an MRL. A programed launcher-traversing capability such as that suggested for the chaff dispensing mission would be especially useful for the leaflet mission.

*Improved Conventional Munitions (ICM)* — ICM could greatly increase the effect of massed MRL fires. Either antipersonnel or antiarmor bomblets can be employed.

*Unattended Ground Sensor (UGS)* — Technically, MRLs can deliver practically any type of UGS. This suggests some unique and potentially profitable innovations.



**A medium MRL currently available is the West German MARS which carries six rounds of 280-mm rockets.**

The precise location of each UGS must be known if it is to provide useful target intelligence, so why not install transponders in rocket-delivered UGSs to assist in precise tracking? A rocket so equipped, fired at a suspect target, could transmit in-flight trajectory and Met data, its own impact location and target intelligence. Since it is often difficult to determine the results of artillery fires, it might also be useful to include two or three UGS rockets with battery salvos and then listen in on the survivors' comments.

*Active ECM* — Studies have examined the possible development of cannon-launched, active-electronic jammers for SAM suppression. The theory is that a small, expendable radar jammer descending by parachute near a SAM site would have greater effect than a larger, expensive jammer operating from a safe distance. Due to lower launch stresses, a rocket-launched jammer should cost less to develop and produce than a cannon-launched model.

*Fuel-Air Explosive (FAE)* — FAE munitions dispense a cloud of fuel which, within a few milliseconds, combines with air and is detonated. The detonation creates extreme overpressures which will destroy vehicles, equipment, mines and personnel, including those in bunkers. One of several experimental FAE munitions, the CBU-55, contained three 70-pound bomblets, each of which would destroy everything in an area about 50 feet in diameter. A similar sized FAE warhead for the MRL might provide a new capability to quickly reduce minefields and bunker lines or possibly even massed armor attacks. For adequate fuel capacity, the warhead may require extra length and a concomitant sacrifice of some range capability.

*Guided Warheads* — The US Navy is developing cannon-launched guided projectiles (CLGPs) for its 5-inch guns. This program includes two seekers, a laser seeker for surface targets and an infrared seeker for use against enemy

aircraft. If we were to adopt the 5-inch improved Zuni rocket motor as the basis for our TMMRL ammunition, we probably could easily adapt the 5-inch CLGP to it. While use of MRLs against aircraft is a bit farout, a rocket-launched, laser- or infrared-guided projectile (RLGP) for use against armored vehicles is quite feasible. At least two other potential guided-missile applications might be adapted to the MRL. These are antiradar/anti-electronic jammer rockets and a rocket which will home on spurious electromagnetic radiations emanating from some generators and other electrical equipment. Obviously, MRLs would not salvo expensive guided rockets, but MRL launch characteristics might bring some of the above capabilities within practical reach.

### **Fuze Systems**

A multi-option fuze, similar to the XM734, which was developed for the lightweight company mortar, seems ideal for the basic high explosive warhead. The fuze options are air-burst, near-surface burst, impact and delay. If air- or near-surface bursts are selected and fail to work, the fuze will function in impact or delay modes. The fuze might also need a short-range arming option and graze-sensitive functioning in order to permit emergency or expedient use of MRLs in direct fire.

A white phosphorous warhead could use the same fuze or a cheaper point-detonating fuze if available. HEDP and RLGP warheads would need special fuzes. Most other warheads would use a time fuze and this presents a problem.

Fuze time data often would be unavailable until moments before a mission is to be fired, and it would be quite a chore to hurriedly set 40 mechanical time fuzes on rockets already loaded in their launch tubes. The obvious solution to this problem is an electronic time fuze.

The electronic time fuze setting system could probably be based on tiny integrated circuit chips similar to those used in handheld electronic calculators. These very inexpensive chips have a number of sophisticated computing functions, all of which are controlled by an integral electronic clock, accurate to 1/250,000 of a second. The chips would communicate with an on-carriage master control system via connections through the warhead and propellant grain to pigtail leads or contact points on the motor base. Alternatively, electrical connections could be made through holes in the launch tubes, directly to contacts on each warhead. The operator could set or reset fuzes any time prior to firing. A fire control computer could set different times in individual fuzes or even program a precise sequence of fuze times for successive rockets in a salvo. The fuze-arming system would operate independently as a function of launch accelerations and projectile spin. The firing system would interrogate each fuze for a valid setting before it triggers a fire signal for that rocket.

### **Remote Controls**

Even those MRLs that operate in a fully manual mode require some remote capability. After all, we might have a problem finding volunteers to light off a load of rockets with a cigarette lighter; one rocket maybe, but no more. From remote firing, it is a small but profitable step to add remote controls for time fuzes. It is a somewhat larger and more profitable step to add remote control for launcher deflection and quadrant elevation. Now, design these features for digital control and you have a system that can link with almost any computerized command and control system, in real time.

Remote control capabilities are the heart of our uniquely American MRL system. Operators would control the launchers through a closed-loop command system operating through either radio or wire circuits. The two launcher systems would use a common digital message format containing such control elements as launcher identification, fuze setting, deflection change in mils, quadrant change in mils, number of rounds to fire, number of rounds per second and fire command. The TMMRL's message format would also include additional elements to provide for computer-programed sequences of laying and fuze changes between individual rocket shots within a salvo. The launcher's on-carriage master control system would execute fuze and laying commands on receipt and store fire-sequencing programs until it received the fire command. Any time prior to firing, the operator could interrogate each launcher to confirm preset and stored values.

These remote control capabilities would give our MRL systems very great operational flexibility. TMMRL sections and batteries should have a capability for fully independent operations, but, ideally, sections, batteries and battalions would interface directly with a computer system such as TACFIRE. Batteries could then disperse individual launcher sections and the computerized control system could still expend any number of rounds or launchers on a single target or several targets. The control system could focus counterfire on enemy targets as quickly as they are located. It could preprogram and store large numbers of immediate suppression targets and within five or 10 seconds of a request, fire massive numbers of projectiles at any target. Visionary? Not really. The necessary technology is elementary by current standards.

Remote control is particularly important to the TOMRL for the illumination mission. Without remote controls, a supported unit would have to select one spot in its area of operations for illumination by each available launcher, or the MRL battery would have to equip each launcher with a communications system and assign as operator. The first option would provide little flexibility and the second would result in unnecessary operator casualties. In contrast, remote control of launcher laying, warhead fuzing and firing would place complete, real-time control of MRL fires

directly in the hands of FDCs, FSOs or, sometimes, even FOs.

Think how far the proposed MRL systems' capabilities could go toward solving some of the more vexing problems we face on the modern battlefield. Can we afford *not* to field such a system — quickly?

### Development

Time is important; so we should be careful not to study an MRL program to death. We first need to get a significant MRL force into the field quickly to gain experience and to supplement our available firepower. Accordingly, we should examine existing launchers and ammunition, resist the "not-invented-here" syndrome, and build on, copy or buy the best features available.

We already have many of the elements needed for an MRL system. Many component items of electronic equipment, machinery and ordnance used with other weapons systems could be adapted with little modification. For example, the improved Zuni rocket, which was probably developed without a thought of using it in MRLs, is comparable to the Warsaw Pact's best rocket in size, weight, range and accuracy — yet delivers 50 percent more payload. But development will still take time. Perhaps while we pursue our own development program we should put an interim MRL into service to gain organizational and tactical experience.

For this interim role, the 110-mm LARS of the German Army seems a good choice. It is a well-developed, mature, "off-the-shelf" system. Its performance approaches that of the Soviet BM-21 system; yet its rocket is 45 percent lighter. When our own MRL comes along, the LARS rocket might find a permanent place in our inventory as the basis of our TOMRL system. Best of all, the LARS is standard equipment in another NATO service. Production and supply systems are already established in the prospective theater of operations.

Regardless of whether we purchase the LARS or manufacture it under license, our use of it would contribute to much-needed weapons standardization in NATO. Also, the German Army is reportedly considering possible follow-ons to LARS; our own MRL could be a serious contender.

In any event, we should not delay deployment of an MRL system while we perfect the deluxe accessories. We should issue basic launchers as soon as they can be made available and, if necessary, retrofit the accessories in the field. Time passes.

### In Sum

On a modern, sophisticated battlefield, as in a major European conflict, our ability to mass firepower is far less

than it was in Vietnam, where its lack would not have been nearly so critical. In other words, we would not be able to fight in the way to which we have become accustomed or in the way which the Warsaw Pact *is* prepared to fight. The MRL offers a means to improve our massed-fire capability greatly at a very low cost for delivery systems. Two hundred TMMRLs and 400 TOMRLs (Poland and Czechoslovakia alone possess almost 700 MRLs) might cost somewhere around 15 to 20 million dollars. Development, plus a million rounds of ammunition, however, might run the total investment over 200 million dollars. That sounds expensive, but it is a little over 7/10 of one percent of the FY77 Army budget and only 1/5 of one percent of the total FY 77 military budget. For further perspective, 10 F-15s or 25 A-10s cost about 100 million dollars, and the projected initial requirement of CLGPs (100,000 rounds) will cost over 400 million. This is not to suggest a trade-off of MRLs for airplanes or for CLGPs; we need them all, and more. Considering our conventional firepower *vis-a-vis* the Warsaw Pact, this is a time to fight for additional funding rather than to accept trade-offs.

A recent study by Belgian General Robert Close, Deputy Director of the NATO Defense College, was published in the 15 March 1976 issue of the *London Times*. The study concluded that the Soviet Union has the capability to launch a surprise attack in central Europe, that Soviet forces could not be stopped by the present NATO strategy and that they would be able to reach the Rhine within two or three days. German General Johannes Steinhoff, former chairman of NATO's Military Committee, in an early 1976 interview published by *Der Spiegel*, stated flatly that NATO forces would be able to hold out for "only a few days" against a Soviet surprise attack. Steinhoff said: "NATO is totally incapable of stemming a massive Soviet attack by means of conventional weapons. It would be completely unrealistic to think it possible."

One must wonder how long the Soviet leaders can resist this opportunity that they have created — to change quickly and forever the face of the free world. We do wonder, and we wring our hands, and we cry that we can't match the Soviets gun-for-gun while still financing our affluent, free societies. But we also know in our hearts that, if we don't do *something*, most or all of our free societies will cease to exist anyway. We don't necessarily have to match the Soviets gun-for-gun in conventional arms, but we *do* have to deploy enough additional firepower to increase our political and military confidence and to disabuse the Soviets of any confidence that they can succeed in a surprise attack or political blackmail. To that end the MRL is not a panacea, but it is probably the quickest and cheapest available means to increase our firepower and survivability by an amount large enough to matter. It might even be enough to tip the balance away from war, and, for that, no price is too great. ☒

**LTC W. H. Rees, USAF, is Chief of the Aerospace Support  
Division, Headquarters, 23d Air Division, Duluth  
International Airport, MN.**



# REDLEG Newsletter

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## Communicator Shortages

The Army is experiencing a continuing shortage of radio and radio teletype operators (MOSs 05B and 05C, two nonartillery MOSs on which the field artillery depends). To offset this shortage, MILPERCEN has taken the following steps: Reduced the enlistment period for MOS 05E and 05F from four to three years; offered a \$2,500 enlistment bonus to eligible enlistees; and, offered additional training in MOSs 05B and 05C to selected soldiers who completed training in MOS 05E (voice radio operator) and 05F (radio teletype operator, non-Morse). Also revised is the career management field 72 progression pattern to allow lateral feeds from MOS 05E to 05 B and from MOS 05F to 05C at the E3-4 levels.

## Enlisted Insignia

On October 1, all enlisted personnel began wearing the branch brass of their primary MOS. Since this change was announced, there has been some confusion as to the brass which corresponds to each MOS. The following information

should make the transition easier for those who should wear crossed cannons.

Enlisted personnel do not have definable, assigned branches as officers do. Soldiers are trained and placed in fields that relate to the basic arms of the Army.

The field artillery's crossed cannons will be worn by personnel of the following MOSs: 13B, 13E, 13W, 13Y, 13Z, 15B, 15D, 15E, 15F, 15J, 17B, 17C, 82C and 93F. All other soldiers (clerks, communicators, cooks, etc.) assigned to field artillery units will wear the insignia of the branch responsible for their particular MOS and career field.

## Step Toward "Total Army"

Members of National Guard units participating in the Army's affiliation program may now wear their active Army unit sleeve insignia on the breast pocket of the fatigue uniform and field jacket — if both the state Adjutant General and the active Army major unit commander agree. National Guard Bureau officials see the move as a morale booster, enhancing the "total Army" concept.

# Commanders Update

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COL Jack O. Bradshaw  
1st Armored Division Artillery

COL John H. Mitchell  
1st Infantry Division Artillery

COL Claude M. Kicklighter  
24th Infantry Division Artillery

COL James F. McCarthy  
25th Infantry Division Artillery

COL Howard R. Guffey  
212th Field Artillery Group

LTC William Heyman  
1st Battalion, 2d Field Artillery

LTC Marion D. Ernest  
3d Battalion, 3d Field Artillery

LTC Jerry L. Bell  
2d Battalion, 4th Field Artillery

LTC Edward G. Walker  
1st Battalion, 6th Field Artillery

LTC Fred A. Gordon  
1st Battalion, 8th Field Artillery

LTC Donald R. Lyman  
3d Battalion, 9th Field Artillery

LTC Charles W. Jarvis  
6th Battalion, 14th Field Artillery

LTC Richard S. Seaward  
2d Battalion, 18th Field Artillery

LTC Donald R. Armstrong  
2d Battalion, 19th Field Artillery

LTC William C. Mayville  
1st Battalion, 30th Field Artillery

LTC Carl M. Clark  
3d Battalion, 35th Field Artillery

LTC Ray Hawthorne  
1st Battalion, 73d Field Artillery

LTC Homer J. Gibbs  
1st Battalion, 77th Field Artillery

LTC Walter E. Olson  
2d Battalion, 78th Field Artillery

LTC Ira Dorsey  
1st Battalion, 80th Field Artillery

LTC Joseph W. Hutchison  
1st Battalion, 81st Field Artillery

MAJ James G. Carver  
3d Battalion, 81st Field Artillery

LTC James L. Merchant  
1st Battalion, 92d Field Artillery

LTC Richard I. Carlson  
2d Battalion, 92d Field Artillery

LTC Robert G. Rhodes  
512th Group

LTC Alan T. Shost  
5th Training Battalion  
Fort Sill

A  
e



by

*This article is the first of a three part serialization of a study conducted by eight officers, members of a recent Armed Forces Staff College class.—Ed.*

The NATO strategy of flexible response provides for a range of responses designed to meet aggression at any level judged to be appropriate to defeat the attack. NATO political leaders and military commanders must have a variety of options at their disposal to increase deterrence to all levels of aggression. One of these options is the employment of tactical or theater nuclear weapons. A number of concepts has been studied to develop realistic methods for employing nuclear weapons in the event of hostilities. The goal is to adopt concepts which provide for political acceptability, collateral damage limitation, escalation control, use of available weapons and delivery means and, perhaps most important, a predictable response from the aggressor. Examined here is one concept for employing tactical nuclear weapons in Central Europe. The concept has three key features: 1) The employment is defensive in nature; 2) the weapons involved are limited in yield; and, 3) the aggressor must have a clear understanding of NATO's intent before the first weapon is detonated.

*Defensive employment* means that the weapons will be on NATO territory. No attempt will be made to detonate weapons in any of the Warsaw Pact countries, nor will any other act be committed that might indicate to the enemy that offensive use is intended. The aggressor is assumed to have already violated NATO territory. NATO's limited use of nuclear weapons is intended to halt that violation by creating obstacles which will impede the enemy's advance.

The weapons are *limited in yield* to very low (less than one kiloton) and low (one to 10 kilotons). Thus, only such devices as atomic demolition munitions (ADMs), surface-to-surface missiles and tube artillery weapons will be employed. For example, the use of air delivered weapons would be far too escalatory for this concept; once an aircraft has taken off, the enemy might easily misjudge its intent, and control of the level of conflict would be jeopardized. The ADMs would be used to create obstacles in mountain passes, defiles and other choke points. The tube artillery weapons would be used to protect these obstacles and, in conjunction with the surface-to-surface missiles, cover area such as the broad north German plain where the use of ADMs is impractical.

The third and final feature of this concept is very important. *The enemy must clearly understand NATO's intent*, for, if he does not, the risk of escalation is greatly increased. The enemy must be told what is happening through diplomatic dispatches or through the use of open news media. He must understand that this use of nuclear weapons is for defensive purposes only and that no

offensive use is intended.

The degree to which this concept of limited defense measures up to the criteria of political acceptability, collateral damage limitation, escalation control, availability of weapons and delivery means and predictability of the enemy's response, rests largely on the objectives which it seeks to gain. Conclusions will be drawn as to the viability of this concept based on how well it measures up to the standards for realistic use of tactical nuclear weapons.

### Objectives

The primary objective of the concept under evaluation is to defend NATO territory with absolutely no militarily offensive objectives. The decision to use nuclear weapons is political.

Although, there are other objectives which might be gained from the defensive employment of tactical or theater nuclear weapons, five are considered most important. The prime objectives are to:

- Demonstrate NATO resolve.
- Deny the aggressor his goal.
- Limit collateral damage.
- Gain time for political consultations.
- Increase deterrence.

### Demonstration Of Resolve

In the late 1950s the strategy of flexible response replaced that of massive retaliation, and tactical nuclear weapons were considered essential to the new strategy. These weapons were of much greater yield than those under consideration in this employment concept, and they indeed played a supporting role in a general war strategy. In the 1960s, leaders of some European NATO countries voiced doubts that the United States would employ US strategic nuclear weapons short of a direct attack upon the US. European NATO leaders felt the devastation of Europe was possible through prolonged conventional war or disastrous nuclear war confined to Western Europe if tactical nuclear weapons were employed. These leaders seemed to feel that, if conventional defense were inadequate, a nuclear warning through the use of tactical nuclear weapons should be issued. If aggression continued, the immediate attack on the Soviet Union by strategic nuclear forces was required. Tactical nuclear weapons were therefore seen only as a link between conventional weapons and strategic nuclear forces. They were meant only as a deterrent while in storage and as a strategic harbinger. They were not intended for use in fighting a war.

This view questions the resolve of NATO. Will the NATO area be defended or is a conventional victory by the Warsaw Pact countries possible?

In the context of strategic nuclear balance between the East and West, President Nixon, in his foreign affairs

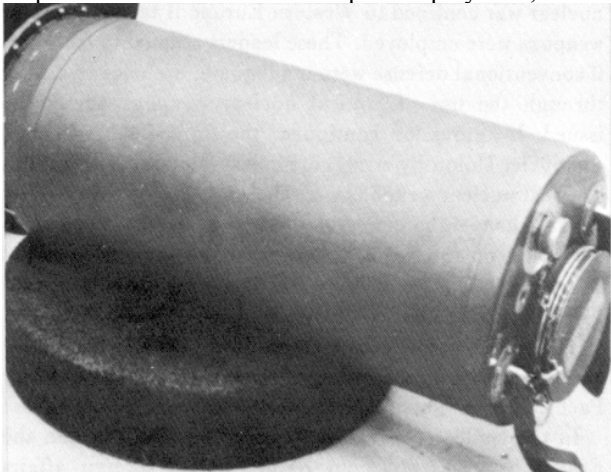
message to Congress in 1970, asked: "Beyond their value as a deterrent in general war, how should our tactical nuclear weapons in Europe be used to counter specific Warsaw Pact threats?" Strategic parity implies that tactical nuclear weapons cannot be used to win a war in Europe because Europe would be destroyed and the nuclear devastation of the United States and the Soviet Union would take place. However, does this mean that a war in Europe between NATO and Warsaw Pact forces can be won by default? The answer is "yes" if one side chooses to yield rather than accept the risks implied in an active defense.

Tactical nuclear weapons of low or very low yield, employed in defense on NATO territory, would demonstrate NATO's political resolve. There would be no victory through default. The employment of these weapons would carry the risk of general war, and for this very reason NATO's resolve to defend her area would be demonstrated.

### **Denial Of Aggressor Goals**

To deny an aggressor his goals and have him change his mind about the gains he may achieve within the parameters of acceptable losses is the second objective. Following the defensive employment of these weapons, the invader (Warsaw Pact nations) must make the political decision to: 1) continue invasion of the NATO area and suffer possible destruction; 2) escalate aggression to full nuclear employment; or, 3) pause in the invasion of Western Europe. Should he pause, then his losses would be minimized. NATO, having demonstrated its resolve, will have denied the attainment of any Warsaw Pact victory, whether the goals were limited in nature (such as a quick thrust to gain a small area) or a total conventional conquest of Europe.

The denial of aggressor goals would destroy the enemy's resolve for a quick victory in Europe. This would also restore the link between conventional warfare and strategic nuclear weapon employment because, if the Warsaw Pact response is one of nuclear weapon employment, then the



**he defensive employment limitations mean only such devices as atomic demolition munitions (above), surface-to-surface missiles and tube artillery weapons will be employed.**

enemy has escalated his offensive and the only credible

NATO response would be the employment of strategic nuclear weapons.

### **Collateral Damage Limitation**

The past emphasis by most European leaders on the deterrence value of tactical nuclear weapons in storage (rather than their value as a defensive weapon of war) results directly from fear of the devastation of Western Europe. Strategic nuclear parity has not changed the Europeans' preference for deterrence over defense; however, strategic parity has forced the European members of NATO to reconsider the possibility of conflict below that of the strategic nuclear level. There is a need for establishing deterrence "locally," and in order to have deterrence against different levels of aggression, a credible defense against each is required.

Technology has made possible the design of nuclear warheads with yields of or below 0.1 kiloton, and precision weapon accuracy now available represents a quantum jump in effectiveness. These two technological advances have the most dramatic effect on the limitation of collateral damage.

### **To Gain Time**

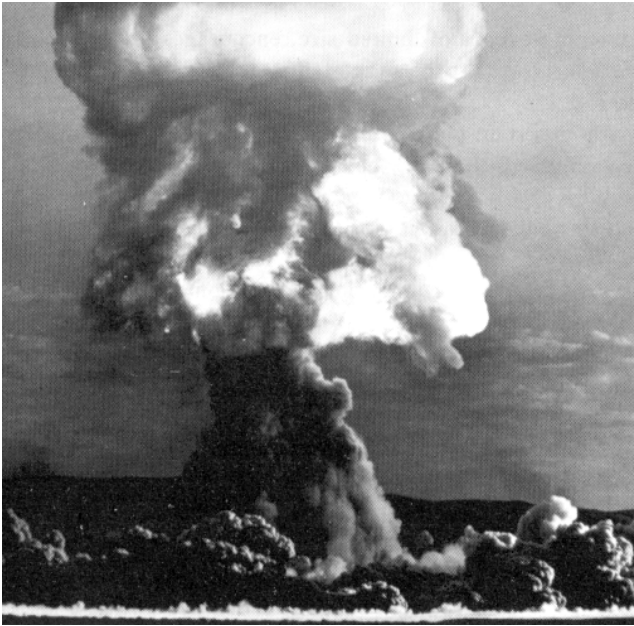
Gaining time for political consultations can be achieved if both sides are interested in preventing the escalation of hostilities.

Low yield weapons employed to gain time will have signaled NATO's resolve, denied the quick attainment of aggressor goals and, with the pause created, placed emphasis on the necessary direct communication between the US President and his Soviet counterpart. The President would explain the intent and meaning of the defensive employment of low yield tactical nuclear weapons. Both sides would still possess their strategic arsenal intact, and a clear demarcation line would have been established — full strategic nuclear warfare or a cessation of hostilities. Time will be gained.

### **Increased Deterrence**

The fifth objective must answer this question: "Will the simple adoption of this defensive concept contribute to deterrence?"

Tactical nuclear weapons used defensively to counter the most immediate and dangerous advance of a Warsaw Pact invasion would not threaten the aggressor homeland. It would, however, demand that he respond in some manner — a pause or an escalation. This NATO reply to aggression is therefore another alternative available within the strategy of flexible response and could provide for early termination short of strategic nuclear response. The aggressor does not know what option NATO will employ. The goal is to convince the aggressor that NATO has the military capability and will use this capability in an effective strategy.



This cloud formation is typical of air burst detonations.

### Political Acceptability

To determine the political acceptability of using tactical nuclear weapons in a defensive manner, we will address three basic areas. First, the political acceptability of weapon deployment must be analyzed before weapon employment can be considered. In other words, would the governments of the US and the Federal Republic of Germany (the two nations primarily involved) agree to put these weapons in the field in the manner specified? Second, what would be the political effect of this deployment? Would it promote deterrence? Third, if deterrence failed and these weapons were used, what political purposes would be served?

There are two considerations to the first question — the American view and the German view. The prevailing mood in America might be against such deployment. The Southeast Asia debacle left the US with a legacy of distrust of things military. Though this feeling has subsided somewhat from the turbulent days of the middle 1960s, it is still an important factor in determining the political feasibility of any military project. For several years, America has been shifting her focus inward. At a time when US financial resources are severely limited, pressing domestic needs often receive higher priorities than important overseas requirements.

A general desire of the US to be viewed as a peaceful, nonaggressive nation also might hinder approval of the suggested deployment, since inherent in the plan is the possible first use of nuclear weapons. Related to this desire have been statements by defense leaders that the US continually will strive to reduce the chance of nuclear war.

Another important factor is the inherent fear of the unknown associated with nuclear weapons. "First use" has

been compared to the opening of Pandora's box. This apprehension has also been expressed in the "firebreak" theory, whereby any use of nuclear weapons, however small, eventually will escalate into a strategic exchange. Can any nation risk annihilation by testing the theory?

Prevailing moods, limited resources, peaceful desires and uncertainty are the primary factors which mitigate against acceptance of the suggested deployment. Some of the factors *favoring* the proposal center around the fact that it coincides with NATO's current strategy of flexible response. Tactical nuclear weapons are not new to the Alliance; they have been deployed in Europe for many years and now total approximately 7,000. The concept of using low yield weapons defensively on NATO territory merely provides a realistic, flexible way to use and update an already existing stockpile of weapons.

Because the proposal calls for possible first use, it is important to note that recent US defense leaders have been careful to keep that option open. In 1971, President Nixon carefully noted that ". . . having a full range of options does not mean we will necessarily limit our response to the level or intensity chosen by the enemy." Then Secretary of Defense, James R. Schlesinger, in a report to Congress on the tactical nuclear force posture in Europe, noted that first use of nuclear weapons by NATO against an overwhelming conventional attack could not be ruled out.

US acceptance of the proposal is also favored by the traditional importance of Europe, collectively America's closest ally and most important commerce partner. Two world wars and billions of dollars in US aid and defense expenditures serve as testimonials to the strength of this link.

In a time of limited resources, cost benefits inherent in the proposal might counter prevailing moods. Secretary of State Henry Kissinger once wrote that the only other option to a NATO tactical nuclear weapon strategy would be a tremendous buildup in conventional forces. Concluding that neither the US nor her allies were prepared to pay that conventional force price, he recommended a tactical nuclear doctrine supported by somewhat larger conventional forces.

Finally, the fear of initiating nuclear warfare needs examination. [The matter of escalation control is the subject of a later installment.] Recent US political leaders feel nuclear warfare can be controlled. Dr. Schlesinger, for example, made this statement: "You raise a hypothetical question; in the event that nuclear weapons were employed, could nuclear war be kept limited? There would be very powerful incentives for that end on both sides because all recognize the destructiveness of nuclear war, but no one, of course, can guarantee that there would not be further escalation, and it is for this reason that our strategy is directed at deterring conflict rather than accepting the consequences of a conflict that has started."

Factors tending to support US political acceptance of this

deployment include its agreement with NATO strategy and first use option, the traditional importance of Europe, possible cost benefits and the importance of credibility and resolve.

### **German Views**

Perhaps the most telling indication that the deployment would not be politically acceptable by West Germany (at least that portion dealing with ADMs) is the fact that in 1969 the West German government refused to allow holes for ADMs to be pre-drilled (pre-chambered) along likely Warsaw Pact armor routes. One reason given for this refusal was German concern that US tactical nuclear weapons would be used primarily for defense rather than deterrence. The underlying basis for the concern was traced to a general lack of faith in NATO's strategic nuclear deterrent. In 1969, Europeans were asking, "Will the US really be willing to sacrifice Chicago for Paris?" The West Germans felt that America's emphasis on defensive weapons, like ADMs, was an indication that the strategic umbrella was gradually being lifted.

Another negative aspect of the concept under study is that nuclear weapons might be expended on West German soil. Because of collateral damage, a proposal designed to save Germany might ultimately destroy it. To many Germans in 1969 it was acceptable to deter war with nuclear weapons, but it was unacceptable to use them to defend and, in the process, destroy their homeland.

There are also political arguments favoring German acceptance of the proposal. Mentioned earlier was the fact that the plan calls for the possible first use of nuclear weapons. This US willingness to initiate the use of nuclear weapons, in spite of the escalation risks involved, should serve to demonstrate to the West Germans a renewed US commitment to the Continent. It may help to restore lost confidence in the Alliance and in America's strategic nuclear deterrent.

Collateral damage is the subject of a later installment. However, it is important to point out here that one of the primary advantages of this proposal is that it specifically limits collateral damage. This feature has great political appeal to the Germans.

### **Political Effects**

Most authorities agree that tactical nuclear weapons would be helpful in preventing aggression and a conventional attack. It has been noted that these weapons link conventional forces with strategic forces and thus increase the aggressor's fear of escalation. There is also the uncertainty over usage created by the presence of tactical nuclear weapons. A potential aggressor never knows if or when these weapons will be used to defend against a conventional attack. The definitely defensive concept, which calls for employment only on NATO territory and involves weapons of limited size, encourages the belief by the aggressor that the suggested weapons indeed would be used.

An important political benefit of actual weapon usage is to gain time — to make the enemy pause before proceeding with his attack. Dr. Kissinger, writing on nuclear strategy, felt this benefit was significant and was one of the reasons he favored early use of tactical nuclear weapons. As a student and later a practitioner of diplomacy, he realized the benefit of negotiating from a position of strength. If tactical US nuclear weapons were not used, he predicted that NATO conventional troops would not be effective in causing a pause. Instead, they would be decimated, Germany would be overrun rapidly and the Warsaw Pact forces would obtain their objective.

The idea of a nuclear firebreak supports the political aim of causing a pause or gaining time. Certainly the first use of tactical nuclear weapons would be a momentous decision on the part of NATO, a significant step in the escalation scale and a dramatic warning to the Soviets.

Causing the aggressor to pause leads to another important political benefit — the pause allows him a chance to change his mind. Here it is important to analyze what enemy forces would look like if NATO weapons were used as proposed. There would be considerable destruction along the aggressor's frontlines, but it would be confined to the areas where the detonations occurred. The enemy's reserve, command and control system and nuclear capability still would be available to him. He would retain most of his fighting capability.

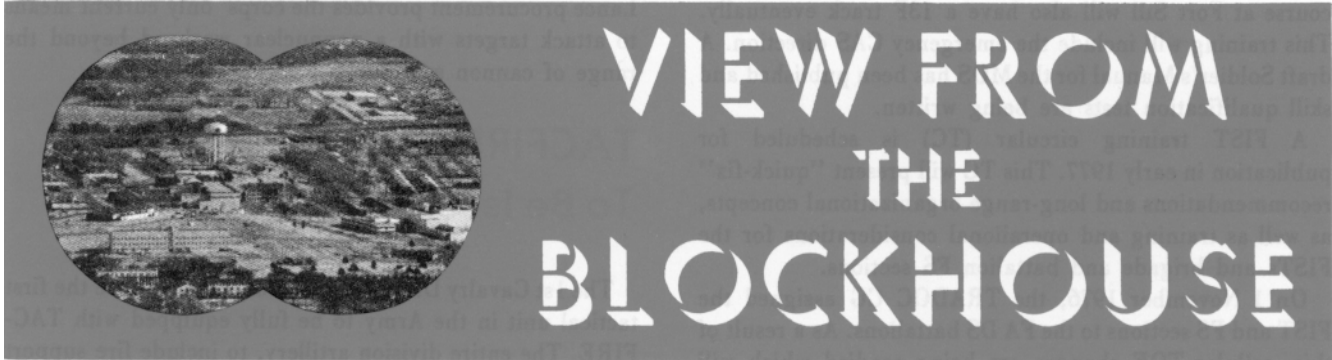
At first glance, destroying only a portion of the enemy's force might seem unwise. A closer analysis reveals that this kind of strategy may be vital if the war is to remain limited. In any conflict between superpowers, one side must not feel cornered or at such a disadvantage that it must either surrender or resort to a theater or even strategic nuclear exchange.

If the enemy can be made to pause and possibly change his mind, the optimum political benefit of weapon employment to stop aggression would be achieved. Whether it will work remains conjecture, but certainly the theory is plausible.

The concept is politically acceptable — based on the determination that weapon deployment would be reasonably acceptable politically, that the proposal would promote deterrence and that, if required, weapon employment would provide significant political benefits. From the standpoint of political acceptability, this defensive concept is realistic and should be adopted formally as one of NATO's flexible response options. ☒

*Next: Collateral damage and escalation control — positive aspects of the LDO.—Ed.*

## Notes from the School



### XCOM

"Even with CABL, we can and must defend the guns."

"In 1984, the M109A1 will have to carry 18 different projectiles, and that won't work."

"It's nice to talk about suppression of enemy air defense, but how do we locate the ZSU-23s?"

Statements like these are argued daily in the Snow Hall coffee shop to little more avail than to satisfy field artillery lieutenants and captains that they have had their say. Similar statements are heard in a forum at least monthly but the people talking are all colonels, and the result of *these* discussions is positive change in the doctrine, organization or materiel of the entire US Field Artillery Community. The forum — the USAFAS Executive Committee. The place — Combined Arms Hall.

Monthly, or more often when burning issues are time-sensitive, 13 or 14 colonels (all USAFAS department and directorate heads) and other key representatives join the Assistant Commandant and/or the Commandant for about two hours of hard debate and discussion. The meetings yield no-holds-barred discussions that are mandatory for the nature of the subjects discussed.

What is discussed? Major phases of key publications, such as ARTEPs, FMs and TCs, are briefed, discussed and approved or sent back to the drawing board. Materiel developments, doctrinal changes and TOE modifications are reviewed when they are of major significance to the Branch or the Army. Often there are briefings solely for informational purposes.

One of the beauties of the Executive Committee system is that the captain or major action officer gets to stand up and present and defend his hard work and thought. Not only is this a tremendous opportunity for the officer concerned, but all questions asked can be answered on the spot and to the point. This eliminates the possibility of a "department briefer" coming back and trying to relay guidance for corrective action.

Are decisions really made at this level? You bet! The long, paper coordination drills are eliminated and command decisions are made. This does not mean that there is any shooting from the hip — every item to be briefed is provided the committee members in advance and

they arrive with their comments well thought out and researched. The proposal is made, discussion is opened for all opinions and then the USAFAS position is determined. There are no "yes men" present. The statement, "I have to differ with you, General, on that point . . ." is heard quite often.

There may still be mistakes made since humans are still fallible, but getting approximately 450 man-years of artillery experience together to try to find the optimum solution is the best way to preclude mistakes in future conflicts.

### FIST Moves On

The FIST concept (*FA Journal*, May-June 1976) and the other recommendations of the Close Support Study Group (CSSG) are alive and well. This is an update on the concept status.

The CSSG recommendations have been briefed Army-wide. The FIST concept gained unanimous support as did the creation of the 13F MOS. All major commands recommended that the FIST and brigade and battalion fire support (FS) sections be assigned to the field artillery direct support (DS) battalions. Most units preferred to reorganize their current assets provisionally for the "quick-fix", rather than the more formal MTOE process recommended by the CSSG. However, all units recognized the need to push the TOE changes which would authorize the personnel and equipment needed to make the FISTs fully effective.

The Field Artillery Officers' Basic Course (OBC) has been modified to provide the training needed for a FIST chief. Fire support planning and coordination instruction has been increased and the lieutenant now receives instruction on the emergency direction of close air support (CAS). In December 1976 the students began to vector Air Force aircraft onto a target where practice bombs were dropped.

Actions to upgrade NCO training and the preparation for the 13F MOS are ongoing. The Basic NCO Course will begin at all NCO academies in January 1977 and will have a course for the 13F NCO. The resident advanced NCO

## View From The Blockhouse

course at Fort Sill will also have a 13F track eventually. This training will include the emergency CAS direction. A draft Soldier's Manual for the MOS has been published and skill qualification tests are being written.

A FIST training circular (TC) is scheduled for publication in early 1977. This TC will present "quick-fix" recommendations and long-range organizational concepts, as well as training and operational considerations for the FISTs and brigade and battalion FS sections.

On 1 November 1976, the TRADOC CG assigned the FIST and FS sections to the FA DS battalions. As a result of this, cellular TOE changes are being readied which will create the appropriate number and type of FIST and FS "cells" to support the maneuver force. All maneuver units are assured of having a FIST or FS section. Reserve Component units will have FS personnel attached to maneuver companies and battalions. These personnel will have the 13F MOS and will equate to the mortar observer sections now organic to the maneuver units. This will allow integrated maneuver and FS training in the widely dispersed Reserve Component units. As opportunities or stationing proximity permit, the FIST members with maneuver units and the FA battalions can combine and train as a team.

Department of the Army will be briefed soon to obtain concept approval at that level. An affirmative assignment decision will permit the 13F MOS documentation and the TOE changes to be approved in the near future.

Units involved in FIST implementation or testing are encouraged to continue. Hopefully, others will begin the conversion and USAFAS will help where possible. Feedback from involved units is needed to fine-tune the concept. For assistance or to provide feedback, units are encouraged to call AUTOVON 639-3878/5714, or write: Commandant, USAFAS, ATTN: ATSF-CR-PM (Major Taylor), Fort Sill, OK 73503.

## Nonnuclear Lance

Recent Congressional action approved procurement of the first US nonnuclear Lance capability beginning in FY77. The nonnuclear Lance is a 40-mile missile system with a warhead weighing approximately 1,000 pounds and containing more than 800 BLU-63 submunitions. This submunition is the same as that loaded in US Air Force improved conventional munition bombs.

The fire direction for the nonnuclear Lance is accomplished using the FADAC or manual backup as in the nuclear system. Also, the nonnuclear warhead uses the same main missile assembly and is compatible with existing ground support equipment.

There are eight battalions of Lance — six in Europe and two at Fort Sill. Each battalion has three firing batteries with two launchers per firing battery. The nonnuclear

Lance procurement provides the corps' only current means to attack targets with a nonnuclear warhead beyond the range of cannon systems.

## TACFIRE To Be Issued

The 1st Cavalry Division, Fort Hood, TX, will be the first tactical unit in the Army to be fully equipped with TACFIRE. The entire division artillery, to include fire support officers at brigades and maneuver battalions and forward observer parties, will begin receiving TACFIRE equipment in June 1977. The division will conduct intensive training through November 1977 to integrate TACFIRE fully into their tactical operations. A TACFIRE training assistance team from the Field Artillery School will be on the ground during the entire training period to provide a pool of TACFIRE expertise.

At the conclusion of the training, the division will go to the field to conduct an exercise in a realistic tactical environment as part of the last major test of the TACFIRE system. The TRADOC Combined Arms Test Agency will administer the 12-day exercise which includes offensive and defensive operations conducted to reflect the battlefieldd environment of the 1980s. Following the test, the 1st Cavalry Division will retain the TACFIRE equipment. Subsequent issue schedule has not been announced.

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**The US Army Field Artillery Board recently completed a concept evaluation program test of the British 105-mm light gun at Fort Sill. The gun, known as the L118, was put through a four-week test designed to evaluate its precision and performance characteristics in a tactical environment using a gun crew drawn from Fort Sill's 2d Battalion, 1st Artillery (105-mm towed). Notable design features of the weapon are its range capability in excess of 17,000 meters, its ease of maintenance at the organizational level, its one-man, two-sight fire control system and its trilux (tritium gas) illumination sources for all sight scales and reticles, eliminating the need for battery operated lighting systems. (Photo by Alvis Kennedy.)**





## Honest John FD Instruction Eliminated

In the past nine months, only one graduate of the Lance/Honest John Operation/Fire Direction Assistant Course (two percent of the total course output), has been assigned directly to an Honest John unit. Moreover, the 15J Soldier's Manual currently identifies no Honest John critical tasks.

Consequently, the program of instruction for the course will be altered to eliminate the three weeks of Honest John instruction and to provide additional practical exercise on the manual and FADAC solution of the Lance gunnery problem. Though the course length will be reduced, the course will provide a better trained soldier. Additionally, the Lance Instructional Branch (Weapons Department, USAFAS) has developed, validated and processed for publication a programmed text to replace the Honest John portion of the resident instruction. Students assigned to Honest John units will be identified before each class graduates and will be provided the text. By completing the programmed test, the individual will develop the basic skills necessary to perform in the Honest John FDC. The text will also be available to the National Guard Honest John units.

## MALOR Is Now Firefinder

The acronym MALOR (Mortar and Artillery Locating Radar project) has been replaced by a new word — Firefinder.

The basic project, to develop and field the AN/TPQ-36 and AN/TPQ-37 radars, has not been altered with the acceptance by the Department of the Army of the radars as replacements for the AN/MPQ-4 radar. The TPQ-36 is designed to detect and locate mortar firings. Aimed at finding longer range, lower trajectory fires, the TPQ-37 is designed to locate artillery units.

The two radar systems are scheduled to reach field units in late 1979, and the basis of issue per division will be three TPQ-36, and two TPQ-37s. Exact location of the new equipment within each division has not been determined. Each type of radar will have its own antenna but the shelter housing the data processing activities will be the same for both.

## Graphical Firing Table Availability

The USAFAS Graphical Firing Table (GFT)/Graphical Site Table (GST) Plant can no longer support requests from the field for GFTs due to a backlog of requisitions from Armament Command and monetary constraints.

This plant is the only manufacturer of these graphical tables for worldwide distribution. The plant's primary mission is to fabricate the tables and fulfill contracts for Armament Command, which in turn fills requisitions from the field. The introduction of newly developed munitions and equipment generates an increased plant workload and further complicates the ability to fill normal requirements.

Current Graphical Firing Scales			
Weapon	Description	NSN	No. of Sticks
105-mm how M101A1	GFT HEM1 (LA)	1220-00-478-5246	3
	GFT HEM1 (HA)	1220-00-151-4155	1
	GFT ILL M314	1220-01-021-7275	2
	GST HEM1	1220-00-815-6190	1
M102/M108	GFT HEM1 (LA)	1220-00-937-8280	3
	GFT HEM1 (HA)	1220-00-151-4154	1
	GFT ILL M314	1220-01-021-8324	2
	GST HEM1	1220-00-764-6422	1
155-mm how M114A1	GFT HEM107 (LA)	1220-00-937-8281	3
	GFT HEM107 (HA)	1220-00-168-5545	1
	GFT ILL M118	1220-00-898-4212	2
	GFT ILL M485	1220-00-133-6219	2
	GST HEM107	1220-00-789-2986	1
M109	GFT ILL M485	1220-00-442-2444	2
	GFT HEM107 (LA)	1220-00-551-3040	3
	GFT HEM107 (HA)	1220-00-551-3042	1
	GST HEM107	1220-00-551-3041	1
M109A1	GFT HEM107 (LA)	1220-00-109-4167	3
	GFT HEM107 (HA)	1220-00-109-4005	1
	GFT ILL M485	1220-00-383-5704	2
	GST HEM107	1220-00-109-3913	1
8-inch how M110/M115	GFT HEM106 (LA)	1220-00-937-8283	3
	GFT HEM106 (HA)	1220-00-168-6026	1
	GST HEM106	1220-00-898-6786	1
	GFT HESM424	1220-00-937-8284	2
	GST HESM424	1220-00-876-8573	1
8-inch how M110A1	GFT HEM106 (LA)	1220-01-021-7272	4
	GFT HEM106 (HA)	1220-01-021-7273	1
	GST HEM106	1220-01-021-7274	1
175-mm gun M107	GFT HEM437 (LA/HA)	1220-00-078-1989	2
	GST HEM437	1220-00-937-9522	1
14.5-mm trainer	GFT	1220-00-442-2446	1
	GST	1220-00-221-6328	1

## View From The Blockhouse

The issue of "paste ons" for conventional GFTs and GSTs has been discouraged because inferior paste-on methods adversely affect accuracy. An exception is the newly developed Improved Conventional Munitions (ICM) scale which should be pasted on. Special instructions for this procedure were published in the September-October 1975 *Field Artillery Journal*. These ICM scales have recently been superimposed on film which will enable discontinuance of paste-on scales.

Requisitions for GFTs and GSTs go through normal supply channels using CTA 50-970 as authority. Recent requests for 8-inch M110A1 GFTs and GSTs indicate the information contained in an article published in the November-December 1976 *Field Artillery Journal* should be referred to again.

Adherence to these requisition procedures will give project managers an accurate picture of supply and demand and will provide timely support for the newly introduced and improved munitions and materiel.

## What's Happening In Survey?

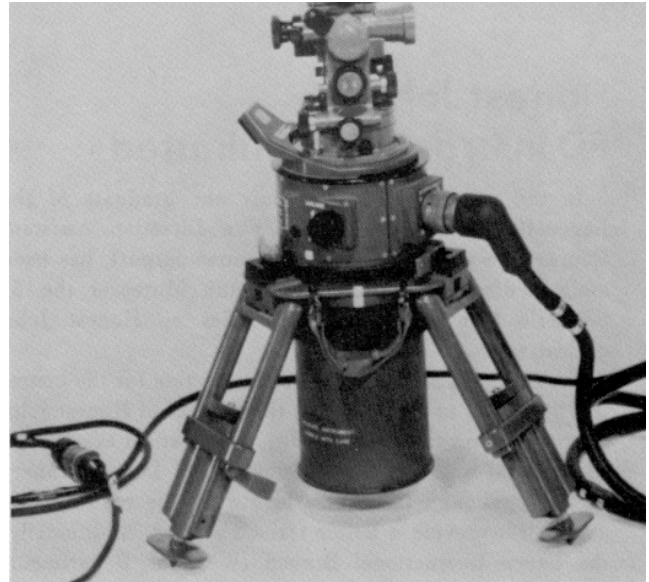
Christmas for the field artillery surveyor arrived early this year. The man with MOS 82C will have several new items of equipment to aid him in his mission of providing position and direction to all firing batteries and the growing family of target acquisition systems. These new items — the hand-held calculator, infrared distance-measuring device, and the lightweight, northseeking azimuth gyro — are all byproducts of the space age. Survey methods are being updated by Training Circular 6-2-1 which outlines many innovative approaches to the solution of the artillery survey problem.

### **Hand-Held Calculator**

Surveyors will soon be able to dispense with the log tables, TM 6-230 and TM 6-231 — they are being replaced by the hand-held calculator. As a result of

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### **DM-60, infrared electronic distance measuring equipment.**



**Lightweight gyroscope azimuth measuring instrument.**

evaluation tests and studies on manpower savings, the Army has purchased a calculator SR-56, manufactured by Texas Instruments Corporation. New flow-type computation forms have been developed for use with the SR-56. Packets of instructional materials, the most commonly used computation forms and lesson plans were mailed in July 1976 to every FA unit which is authorized a survey section/platoon.

The Counterfire Department, USAFAS, is working on a modification to the instrument lighting kit of the T-2 and T-16 theodolites that will permit operation of the hand-held calculator independent of its internal battery pack.

### **Infrared Distance-Measuring Equipment**

One of the recent items of equipment issued to the field artillery surveyor is the survey electronic distance-measuring equipment, infrared, Model DM-60. This new distance-determining device operates by measuring the phase-delay of modulation signals on an infrared light beam traveling at a known velocity from the DM-60 to a prism type reflector and back to the instrument. An optical line-of-sight is required. With the DM-60 as a component of the fifth-order survey party TOE (all parties except div arty and the TAB), distances up to 2,000 meters can be measured in approximately five minutes. Experienced instrument operators can become proficient with the DM-60 in approximately one hour.

The DM-60 system contains a distance meter group, a reflector group, and accessory items. When set up for operation, the distance meter measures and displays distances and provides an automatic readout with a resolution of one millimeter. Atmospheric corrections are not required to achieve FA survey accuracies.

One word of caution: Do not throw away the 30-meter tape; it is still the fastest method of measuring very short distances or for use as a back-up means of distance measurement.

The DM-60 instruments are being issued on a unit priority basis at a rate of 20 per month.

### **Azimuth Gyro**

With the new surveying instrument, azimuth, gyroscope, lightweight (SIAGL), a direction can be determined under all but extreme weather conditions, without lengthy computations and with an accuracy comparable to astronomic observations. This new instrument is for use in latitudes between 75 degrees north and 75 degrees south.

SIAGL is a portable, north-seeking gyroscope capable of determining true north with high accuracy without the assistance of celestial or landmark sightings within approximately 15 minutes after power is applied. Experienced survey instrument operators can become proficient with the SIAGL in approximately one hour.

The SIAGL replaces the ABLE orientor and is authorized on the basis of one for each DS battalion, two for each GS battalion, and two each for the TAB and HHB, div arty. Nondivisional cannon battalions are authorized two and the Lance battalion six. A change is being considered to increase DS battalion authorization to two.

### **Training Circular 6-2-1**

TC 6-2-1, which will be distributed early in 1977, introduces new concepts and techniques for providing responsive survey data to firing units and target acquisition systems. Written for the surveyor and his immediate supervisor, the TC also provides the commander a means to evaluate the effectiveness of his survey operations. There has been no attempt to prescribe "locked-in concrete" accuracies. The battlefield situation may require acceptance of less accurate survey methods. The *time* and *resources* available, balanced against *requirements* and the *situation*, dictate the survey methods and resultant accuracies.

If your unit has received this equipment and is experiencing difficulties, please contact the Survey Division, Counterfire Department, USAFAS, Fort Sill, Oklahoma 73503, AUTOVON 639-2805.

## **Upkeep Of LWSS**

Input from the field indicates that units are having difficulty obtaining replacement components for their lightweight screening systems (LWSS). The

components of the LWSS are listed below for the information of all.

LWSS (complete): NSN 1080-00-103-1246.

LWSS components:

Hexagon screen, NSN 1080-00-107-8589\*

Rhombus screen, NSN 1080-00-107-9206\*

Camouflage screen lanyard, NSN 1080-00-582-2158

Screening repair kit, NSN 1080-00-108-1114

Screen system case, NSN 1080-00-108-1155

LWSS support system (complete): NSN 1080-00-623-7295.

LWSS support system components:

Aluminum nestable pole, NSN 1080-00-109-3505

Batten spreader, NSN 1080-00-108-1545

Batten adapter, NSN 1080-00-108-1595

12-inch aluminum stake, NSN 1080-00-108-1654

Camouflage support system case, NSN 1080-00-108-1646

Note: \*Indicates those components that are not expendable items.

## **Note For Reserve Components**

Yes, Virginia, there are still 8-inch towed weapons around and units with these weapons are reporting difficulty obtaining the necessary technical manuals.

The manuals, TM 9-1350, TM 9-3004 and TM 9-1030-203-20P are still available *in limited numbers* from the St. Louis AG Publications Center. Units must use a DA Form 17 and, because of the restricted availability, must state on the request that they are a Reserve or National Guard unit. Units should hold their requests to the absolute minimum number required.

If further information is needed, units can contact the Publications Center at AUTOVON 698-7337/7316.

## **New 8-Inch Charge In Production**

The M188 propelling charge for use in the M110A1 8-inch howitzer family is now in production.

A supplement to current 8-inch propelling charges (including the M1 green bag for zones 1 thorough 5 and the M2 white bag for zones 5 through 7), the M188 super charge will provide extended range for the 8-inch projectile.

The new charge incorporates center core ignition, triple base propellant and additives for reduction of coppering, wear and flash. Design and development of the M188 were initiated during 1971, tested at Fort Sill, and first production was completed during September 1976.

## RIGHT BY PIECE

### Adventure Training

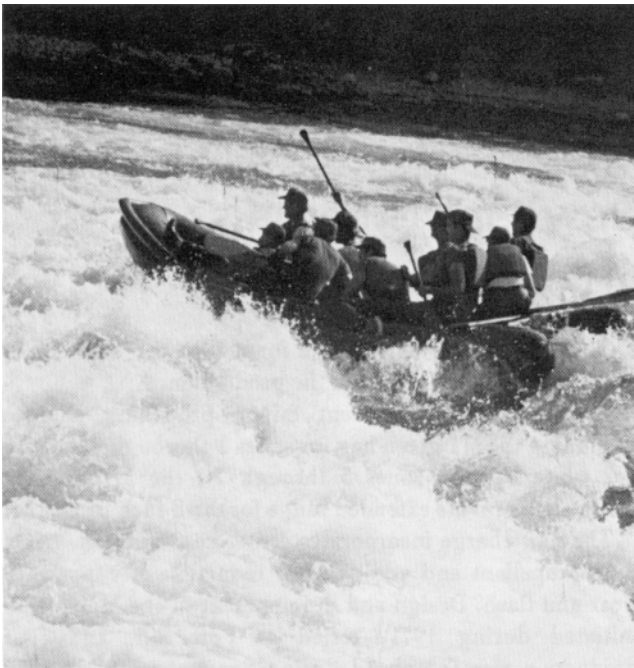
KITZINGEN—"Man, that was a blast!" screamed one of the crewmen.

"Stroke, stroke," shouted the commander.

These comments were neither a reaction to a howitzer firing "blast" nor exhortations to the crew of a weapon with separate loading ammunition. They were comments heard from men of the 1st Battalion, 76th Field Artillery, as they took part in a raft trip down the Lech River in West Germany.

After a tiring trip to Grafenwoehr, the unit selected this activity as their Adventure Training. For 11 days, teams of eight to 12 men competed among the batteries of the battalion.

The route started on the Lech River near Austria, went through Nuernberg on the Danube and ended on the Main River near Kitzingen. "WHITE WATER AHEAD!" would alert the crews to the fun and fear of river rafting. Not all the racing was done in the water. An essential aspect of the competition was how long the team took to circumvent on land the many dams encountered on the trip.



White water ahead! (Photo by Clint Wardlow.)



**KELLEY BARRACKS** — LTG David E. Ott, center, assumes command of VII Corps and the Greater Stuttgart Military Community from LTG Frederick J. Kroesen in a ceremony at Kelley Barracks. General Ott came to the position from Fort Sill where he commanded the US Army Field Artillery Center and School for three years. Immediately following the ceremony, Lieutenant General Kroesen was promoted to general by GEN George S. Blanchard, USAREUR Commander-In-Chief.

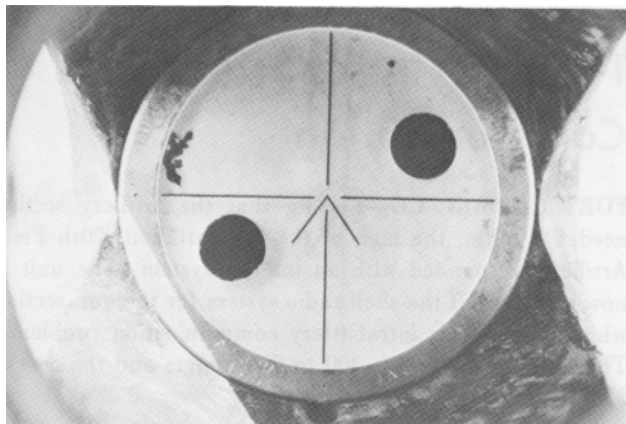
### 1-2d FA Boasts Better Boresighting

BAUMHOLDER—The 1st Battalion, 2d Field Artillery, has not built a better mousetrap, but they are using a better boresight technique.

Shown in the photo is the plexiglass disc mounted in the muzzle of a 1-2d FA M109A1. The disc was adapted from a similar device being used by West German field artillerymen and it replaces the "string and tape" used for so many years to mark the center of the tube during boresight. Use of the device is not only much faster, but it is also more accurate.

The disc has been fabricated by a training aids office in Frankfurt and will be used by the 1-2d FA pending receipt of the M140 Alinement Device for "100" series sights. The M140 has been purchased by DA and is currently being fielded.

Device with paper backing mounted on M109A1.



## FAALS Development Advances

FORT MONMOUTH, NJ—A \$3.4 million contract for the design, fabrication and testing of an advanced development model of a field artillery acoustic locating system (FAALS) has been awarded by Department of the Army to Honeywell, Inc.

FAALS uses improved sound ranging techniques and processing to detect and locate enemy artillery. Sound ranging techniques have been utilized for this purpose since World War I. The current basic sound ranging system, the GR-8, has been in use since World War II. Since that time, remote sensor technology has progressed rapidly and provided the basis for significantly improving sound ranging operational capabilities.

The concepts to be validated during advanced development include remote emplacement and operation of

a distributed sensor array, an adaptive acoustic sensor and a computerized location center.

The program is managed by COL Louis Friedersdorff, Project Manager of the Remotely Monitored Battlefield Sensor Systems. (See article by Colonel Friedersdorff on page 54.—Ed.)

## Div Arty Takes Organization Day

FORT HOOD, TX—Division artillery carried the day in recent Organizational Day competition in the 2d Armored Division. The three brigades, DISCOM and division troops were represented but failed to match div arty's 35 points which came mainly from earning second place in the unit display competition and first place in the 200-meter dash, 400-meter relay, volleyball, road wheel relay and pie eating contests.

The 35 points qualified div arty to receive the Commander's Cup presented by "Hell on Wheels" Commanding General, MG George S. Patton.

## Redleg Run

FORT ORD, CA—On Friday mornings the soldiers of the 7th Infantry Division Artillery demonstrate that morning parade is alive and well by completing "Redleg Run" — a 3.2 mile circuit of the main post.

The Redleg Run gives the individual the opportunity to measure his physical fitness, while the unit gauges its overall physical training program. During a recent run, 97 percent of the cannoners completed the circuit.

The unit competition for the highest percentage of those finishing is becoming intense as the number of out-of-shape Redlegs declines.



## Right By Piece



**FORT POLK, LA —** The recently activated 3d Battalion, 21st Field Artillery, of the 5th Infantry Division, has received the first two of its 8-inch weapons. The battalion was activated in June 1976. The weapons received are the M110 self-propelled howitzer and have been nicknamed "Avenger I" and "Bastogne." The unit was so pleased finally to have howitzers for training that the men held a champagne christening ceremony complete with ceremonial Revolutionary War uniform worn by the section chief of Avenger I, SGT Ray L. Thornton.

In subsequent ceremonies, MG Robert Haldane, then division commander, took part in the first firing. (Photo by Darrell Johnson)

## NG Battalions Honored As Best

WASHINGTON—Two field artillery battalions have been selected to receive the Milton A. Reckord Trophy for being the outstanding battalion-sized units within their Army Readiness Regions.

Selected from their respective regions were the 1st Battalion, 86th Field Artillery, a 155-mm SP unit from Vermont, and the 1st Battalion, 487th Field Artillery, a 105-mm towed battalion of the Hawaii Army National Guard. Selections from the nine ARRs went to the two FA battalions, one infantry unit, two armor battalions, three engineer battalions and one maintenance battalion.

The award is named in honor of the late LTG Milton A. Reckord whose military career spanned 64 years including 45 years as the adjutant general of Maryland.

## 6-80th FA Fills Out

FORT ORD, CA—The 6th Battalion, 80th Field Artillery, the general support battalion of the 7th Division, has added its fourth firing battery to the great pleasure of the division.

The reason for the more-than-routine nature of the additional unit is that the new battery, Delta, is the 8-inch battery of the division's composite 155-mm/8-inch battalion.

The first weapons have arrived and complete equipment fill is expected in the next few months.

## 1-20th FA Intrabattery Communication

FORT CARSON, CO—Feeling that the artillery section needed a radio, the men of the 1st Battalion, 20th Field Artillery, responded with an interim system. The unit is now using an off-the-shelf radio system for the gun section which solves their intrabattery communication problems. The range capability is 300 to 500 meters and the cost is \$240.

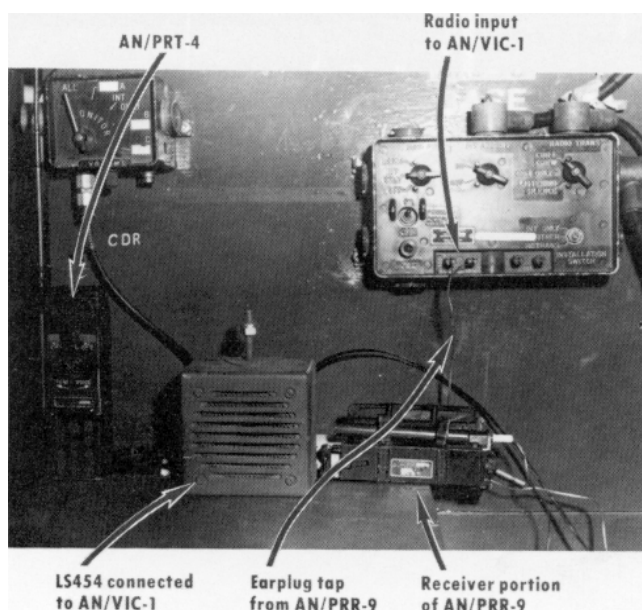
The essential parts of this combination are the radio receiver AN/PRR-9 and radio transmitter AN/PRT-4. The radio is issued to the infantry squad and, because it is designed to be hung on a squad leader's helmet, has not been popular. Artillery section chiefs would fare no better with PRR-9 receivers hung on their helmets while doing their jobs.

Although the radios are being phased out, some are still available. By fixing the PRR-9 receiver to the howitzer hull and tapping its output into the AN/VIC-1 system amplifier, a puny audio signal can be greatly boosted. The entire section can hear through the LS454 speaker which Fort Sill recommends for each howitzer. The transmitter portion of the PRT-4 can be hung nearby for the section chief or radiotelephone operator to read back fire commands. The 1-20th hooks the system into a whip antenna attached to the outside of the track. The FDC track can net with the howitzer using a comparable system.

When wire is laid to the howitzer, the telephone and WD-1/TT can be connected to the same amplifier of the AN/VIC-1, and the PRR-9 may be switched off to save its batteries.

The only problems found by the 1-20th with this interim radio system are possible repair parts and battery deficits since the squad radio is being phased out.

### Essential parts of the interim radio system.



## Artillery Day In England

LARKHILL, UK—About 20,000 people turned up at the Royal School of Artillery, Larkhill, England, to see the annual firepower and static demonstration. More than 70 guns, with calibers from 105-mm to 8-inch fired concentrations, engaged tank targets, and demonstrated their mobility and speed into and out of action. Some guns were air-landed by C-130 aircraft, and some were parachuted in by helicopter — the crews rappelling to the ground on ropes. Some 105s even entered on skis on a specially laid "track," while the self-propelled and some of the towed batteries arrived in the more conventional style.

The principal guns used in the firepower demonstration were the Italian built 105-mm pack howitzers currently being replaced by the new British 105 gun in light, parachute, and marine commando regiments [See "View From the Blockhouse" item—Ed]. The Junior Leaders Regiment manned a battery of the now obsolete 25 pounders which are still used to train these teenage apprentice soldiers as part of their NCO Academy program of instruction. The 3rd Regiment, Royal Horse Artillery, fired their 5.5-inch guns for the final time before the unit reorganizes as the Antitank (Swingfire) Regiment in Germany. Batteries of the 105-mm self-propelled Abbots, used in the direct support units of the Royal Artillery, were also fired as were some 8-inch, 175-mm and 155-mm guns from the general support elements.

The static display covered the whole range of weapons and equipment in service with the Royal Artillery and some which are about to be introduced.

The static display covered the whole range of weapons and equipment in service with the Royal Artillery and some which are about to be introduced.

The British/German/Italian FH 70 attracted much interest. This 155-mm towed howitzer has now been accepted for introduction into service following extensive trials. It fires a standard shell to 24 kilometers and will have a rocket assisted capability out to 30 kilometers. It has a burst-rate-of-fire of three rounds in 20 seconds and is equipped with a small auxiliary power unit which enables it to be moved over short distances without a prime mover.

The Swingfire wire-guided, long-range antitank guided weapon (LRATGW) has only recently become an artillery weapon as a result of the decision to return the responsibility for LRATGW to the Royal Artillery from the Royal Armored Corps. A battery of 78 launch tubes will support each division. Swingfire has a range of four kilometers (flight duration of 26 seconds) and weighs 60 pounds. The controller can be sited up to 100 meters from the launcher itself.

The Royal Artillery has also taken over the Blowpipe shoulder-fired, beam-riding air defense missile. The 55-inch launcher weighs 28 pounds and the missile weighs 19 pounds. Blowpipe can also be used against surface targets at ranges up to three kilometers.

The US Lance missile is replacing the Honest John as the nuclear weapon in the British Army. The first UK Lances were fired successfully on the Hebrides range off the west coast of Scotland recently.

Important advances made in target acquisition were also demonstrated. Radio link microphones are now used for sound ranging. No longer are miles of wire needed. The cymbeline radar is used for mortar location. It has a range of 14 kilometers, is fitted with a built-in Wankel generator, and weighs slightly over 2,000 pounds when trailer-borne. It is mounted on an APC in units in Germany.

The Canadian built USD501 (Midge) drone has been in service for three years in Germany, and procedures and drills have been so improved that a commander can now have photographic or infrared line scan results of a day or night (flash illuminated) mission within one hour of a typical launch. Although operated by the Royal Artillery, Midge is tasked by the intelligence staff of a division or corps. Midge flies at a speed of 400 knots and has an operating radius of 45 kilometers. Accurate recovery is achieved by means of a beacon on which the Midge "homes." When descended by parachute, its landing is cushioned by inflated bags.

The British Locating (Target Acquisition) Regiment in Germany additionally provides survey and meteorological data to the guns. The MRA5 tellurometer greatly simplifies distance measuring. It can be mounted on a 50-foot

*(Continued on page 31)*



## The *Journal* Interviews . . .

# LTG (Ret) James F. Hollingsworth



**During a visit to Fort Sill as guest lecturer at a Leadership Symposium for the Officer Advanced Course, LTG Hollingsworth was interviewed. This recently retired veteran of 36 years was a maneuver commander with an outspoken appreciation for firepower.**



**Journal:** *As your last command was I Corps (ROK/US) Group in Korea after which you made a comprehensive study of NATO's posture, would you describe your concept of the next war?*

Hollingsworth: If we fight a large scale war in the near future, whether in Europe or Korea, it will be against either the Democratic People's Republic of Korea or the Warsaw Pact communists. Both have shown their tendency to disregard the value of human life. Since they have little regard for life and far more men under arms, they will throw millions of men against us. Because we have fewer soldiers and place a great premium on people, we must use our superior technology and relatively inexpensive weapons to overcome the attack. Simply put, I see a short, violent war which will be won by our preponderance of destructive firepower.

We will match our least expensive and most lethal weapon — munitions — against their cheapest and most vulnerable weapon — people.

**Journal:** *You have long been a supporter of the development of munitions instead of weapons. With the current proliferation of shells, should we be adding more?*

Hollingsworth: We must use our superior technology to maximize the killing power and destruction potential of our current delivery means. We have made great improvements over the past decade, and scatterable mines, improved conventional munitions and the cannon-launched, guided projectile, will give us a great array of efficient, cost effective munitions. I very much look forward to gaining a multiple rocket launcher for the massive, instantaneous delivery of fires by a single system which will leave our howitzers free for more selective use.

**Journal:** *The current study of a restructured division with 90 field artillery weapons instead of the current 54 is promising from a firepower point of view. Do you see any pitfalls in this "new" division?*

Hollingsworth: I am certainly happy to see the increase in artillery, but I am concerned about the reduction in the size of tank units. We *must* maintain sustainability — the ability to fight very hard battles for several days and then either hold what we have gained or conduct pursuit operations. I fear that by going from five tanks per platoon to three, units and, therefore, flexibility will be lost sooner. Currently, if you lose two tanks from a platoon you still have a platoon at 60 percent. With a two tank loss from a three tank platoon, you've lost a unit.

**Journal:** *Do you see the day when maneuver units, doctrine and tactics will be reorganized to support firepower as opposed to current doctrine of firepower supporting maneuver?*

Hollingsworth: We are already at that point. We must deploy our combat units to force the enemy to maneuver in such a way as to be subjected to firepower. One major reason for increasing our artillery range capability is to reach out and attack the enemy 15 to 18 kilometers forward of the main battle position. Not only does this overcome his superior numbers before the battle is joined, it disrupts his formations and this disruption is a major factor. Many people are not aware of the lack of authority and flexibility within the communist chain of command. We believe that, in many cases, a communist battalion commander must go as high as the equivalent of our corps to get permission to reorganize or redeploy. By hitting this battalion with massive firepower 15 kilometers from the front lines, we can effectively



eliminate his unit from the battle.

**Journal:** *Is there a future role for the 105-mm howitzer with its limited range and lesser lethality?*

Hollingsworth: I see no role for the 105-mm on the future battlefield. The 155-mm howitzer now has an acceptable rate of fire, an excellent range and a multiplicity of munitions with great effect on the target.

**Journal:** *Would you comment on reports that President-elect Carter plans to withdraw all US ground forces in Korea? Do we still need a division there?*

Hollingsworth: We must maintain a presence in Korea. There is not a more anti-communist state in the world than South Korea. We must stand by them. Our presence there acts as a major deterrent and stabilizer on the Asian mainland. Also, Korea plays a major role in the security of Japan, to which we are committed. The 2d Infantry Division is not a mere symbol — it is a potent deterrent to the wreckless, irresponsible, lunatic leaders of North Korea.

**Journal:** *After leaving Korea, you made a thorough study of US Army Europe and NATO. Would you comment on your findings?*

Hollingsworth: At the direction of the Chief of Staff and the Senate Armed Services Committee, I headed a team that spent three months studying the European situation and analyzing our capabilities. We made 89 recommendations for improving our conventional capabilities.

Among the findings was a confirmation of the malpositioning of NATO's forces — but this is more a

NATO problem than a US one. We found great shortcomings in conventional firepower. There is a need for more quantity and greater variety of munitions as well as a much larger number of delivery systems. Also, we commented that the 5,600 men in Pershing have no role in a conventional war. We cannot afford this many spaces for a nuclear war that may never be fought. They need a conventional capability. With the accuracy of Pershing 2 and its inherent range, it would be extremely valuable against deep, hard, point targets. Finally, we reported that our Army air defense in Europe is inadequate. The Army *must* assume a larger role in air defense if we hope to have Air Force sorties for close air support. The Soviet air threat is great — I know what it is like to be bombed — and air supremacy is the first priority for the US Air Force. Our Hawk units must be upgraded immediately.

**Journal:** *Sir, what one change would you make in the Army if you had the authority and resources?*

Hollingsworth: I would increase our firepower 100 percent. As an armored task force commander in Germany in November 1944, we were attacked by a heavy tank battalion of 22 tanks. We requested a 32-battalion time-on-target mission from the field artillery and got it. Those enemy tanks that weren't disabled, retreated. That convinced me of the importance of firepower and that is what I want every tank commander to be able to do if we ever have to fight again.

**Journal:** *Thank you.*

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## Right By Piece *(Continued from page 29)*

pneumatic mast and has an automatic, direct read-out capability.

The position and azimuth determining system (PADS) will further help solve survey problems. It is an inertial navigation platform. Mounted in a quarter-ton vehicle, PADS can be driven from a known point to a gun position or OP. Exact location and direction are produced automatically, provided the vehicle has been halted for a few seconds every 10 minutes to allow the instrument to update itself.

Finally, the new artillery meteorological system (AMETS) was shown. By use of this equipment, the in-service FACE fire direction computer, and improved communications, firing batteries can be fed met data directly by tape every hour. These tapes go straight into the firing battery FACE to achieve an immediate update.

The Annual Artillery Day not only provides the opportunity for the Royal Artillery to show off its professional expertise but it is also a social event where past and present members of the Regiment meet and exchange news — and where many young future artillerymen get their first sniff of powder.

## Redlegs Escort Special Children

WACO, TX—Thanks to the men of the 2d Armored Division Artillery, about 45 handicapped children were able to enjoy an afternoon at the Heart O' Texas Fair in Waco.

For the fourth consecutive year, the Fort Hood, TX, division artillery provided about 80 soldiers to act as escorts to children from the Central Texas Rehabilitation Center. The children included many ages with varying degrees of handicaps.

Two men accepted the responsibility for one child's well-being and entertainment at the fair. Rides on the midway were provided without charge by the fair management and the soldiers paid for food and carnival games. Funds used by some escorts came from unit donations while other escorts used their own money.

There were several men among the group of soldiers who were on escort "duty" for a second time. One remarked, "It brings the morale of the kids up and lets them know somebody cares."



by COL Kenneth R. Bailey

*The author commands the 41st FA group which is in V Corps and has two 8-inch battalions, a 175-mm battalion and a Lance battalion. What follows is part of a briefing given during the Senior Field Artillery Commanders' Conference at Fort Sill in October 1976.—Ed.*

Until March 1976 all the cannon battalions within the 41st FA Group were placing their headquarters and service batteries in the same location. We found that the almost 200 people (figure 1) and more than 50 vehicles of the combined batteries were very cumbersome to move at one time, particularly if the headquarters and service elements became intermingled with the firing batteries. We also found that we were vulnerable on the move — in some cases more vulnerable than when we were firing. We tried to reduce that vulnerability by moving during hours of darkness or low visibility and moving less frequently. We found that while moving headquarters and service elements and trying to keep up with tactical operations, we did not have time to perform maintenance. The net decision was to split the headquarters and service elements. Figure 2, based on an 8-inch battalion, gives you an idea how we went about doing this. On the right are numbers in brackets; for example, across from the survey section, there are 18 personnel (-[18]) who are subtracted. Basically, this represents three six-man survey sections — one going to each of the firing batteries. From the radio section, nine people are subtracted — allowing one radioteletype rig for

<b>Background</b>		
Each cannon battalion in the group was locating the headquarters and service batteries in the same field position:		
<i>Battery</i>	<i>Personnel</i>	<i>Vehicles</i>
Headquarters	132	33
Service	65	21
Total	197	54
Disadvantages:		
Cumbersome		
Vulnerable		
No time to maintain		
Unresponsive		

**Figure 1**

each of the firing batteries. Three people are removed from the medical section — a medic per battery. The four personnel taken from the Redeye section, one will operate with the trains, the section headquarters with the command post and two in the general area of the firing batteries. Finally, across from the ammo section, note that 21 personnel from firing batteries are added to the ammunition section in the trains area.

Personnel					
Section	HHB	Svc	Trains	CP	
Bn HQ	9		4	5	
Btry HQ	17	19	28	8	
HQ support	8		8		
Op plt	7			7	
FDC	11			11	
Survey	21			3	−[18]
Liaison	2			2	
Comm plt HQ	7		5	2	
Wire	16			16	
Radio	19		3	7	−[ 9]
Medical	7		2	2	−[ 3]
Redeye	8		2	2	−[ 4]
Bn supply		10	10		
Bn maint		16	16		
Ammo HQ		4	4		
Ammo		16	37		+ [21]
<b>Totals</b>	132	65	119	65	−[13]

**Figure 2**

Figure 3 shows the same information on vehicles. The two 1/4-ton vehicles are used by the Redeye teams; three of the gama goats are used for the radioteletype rigs and three are used by the survey personnel who go to the firing batteries. The six 5-ton trucks that were added to the ammo section are half of the ammo vehicles from the firing battery. Even though we took all the ammo section personnel, two 5-ton vehicles were left in each firing battery to move ammunition within the battery area and to provide a limited ammo carrying capability.

To recap, we decreased the command post to 14 vehicles and about 65 people to make it at least as mobile and flexible as the firing batteries it is required to move with. The trains commander is the S4 and the headquarters commandant in the command post area is the headquarters battery commander.

With regard to employment, the firing elements of the battalion and the command post are normally about 2 to 10 kilometers behind the forward edge of the battle area (FEBA). The command post can be by itself or colocated with one of the firing batteries. If it is colocated, radio communications can be reduced slightly by laying a wire line from the command post to the firing battery. In our experience on Army Training and Evaluation Programs and in REFORGER, we found that the trains move once for every two to four moves of the firing batteries. By reducing the number of times that the trains move, we are able to displace them deliberately. We can plan and decide where and when we are going to move them, because they are not tied to the moves of the tactical units. Positioning the trains back from the FEBA helps reduce their vulnerability. In some cases, the trains may be located in a town or use barns and buildings as places to hide and operate. With regard to DS maintenance, any major maintenance that can not be done by a DS maintenance contact team would be done in the trains area. On REFORGER we were able to pull packs and perform

maintenance of that nature by keeping the trains situated in one place for a period of time.

In general, by locating the trains farther back, they are closer to the POL, rations, etc. The location of the trains to the rear also helps solve the ammunition problem we sometimes have in Europe, when the ammunition supply points are located very far to the rear. Also, based on our basic load, ammunition carrying capability and requirement to fire, we think there may be some need to down-load ammunition once we get in the battle positions. Often we would rather down-load it in the trains area than in the firing battery area. Particularly if we are with the covering force or in the active defense and it is unlikely that we are going to be moving forward to pick up ammunition in a firing battery area.

### Advantages and Disadvantages

In summary, these are the advantages:

- Less vulnerable.
- Less cumbersome.
- Improved logistics to include ammunition and maintenance.
- More responsive.

These are the disadvantages:

- Command post perimeter is thin.
- More coordination/communication required.

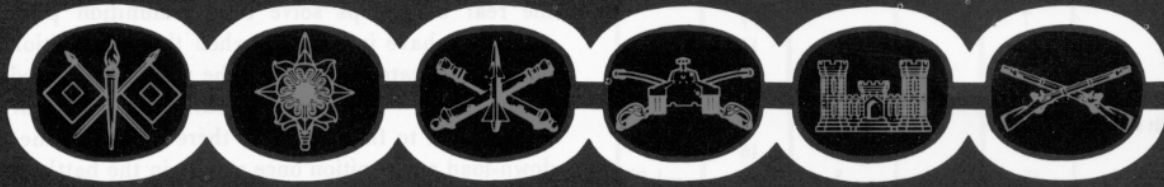
The command post perimeter problem can be solved by locating the command post with a firing battery. We have solved the coordination/communication problem by keeping the trains on the admin/log net and having the firing battery come on the net when necessary. The key is the service battery commander — he has to move around and he has to be on top of everything.

We think the trains concept has some advantages and we like it. All the group's cannon battalions are using it now. This is the battalion commander's choice, but we think that we get some value from it and we will continue to improve it. Both the trains and command post can be tailored and employed to fit the mission, terrain and threat, for the best possible configuration. Even though the trains concept is not new, it is well worth new consideration.

Vehicles					
Type	HHB	Svc	Trains	CP	
1/4-ton	10	1	5	4	−[2]
Gama goat	17	2	6	7	−[6]
2-1/2-ton	3	6	8	1	
Ambulance	1		1		
5-ton		8	14		+ [6]
5-ton wrecker		2	2		
M577 CP	2			2	
M578 recovery		1	1		
M88 recovery		1	1		
<b>Totals</b>	33	21	38	14	−[2]

**Figure 3**

*with our comrades in arms*



## Laser Fire Control Systems For Tanks

An \$11-million contract to produce 69 laser tank fire control systems for the Army's main battle tank has been awarded Hughes Aircraft Company. The contract signals the start of an extended production program to equip M60A1 tanks with a fire control system to improve the firing accuracy of the tank's 105-mm gun.

The system is designed to increase the tank's first-round hit capability against both stationary and moving targets and includes a laser rangefinder and a ballistics computer.

Twenty prototype units already have been delivered and have undergone extensive field tests and evaluation.

Laser range data are processed by the computer in milliseconds with other data such as crosswind velocity, air temperature, gun trunnion tilt, air density, altitude, target tracking rate and ammunition ballistics; these data are then used to provide the correct azimuth and elevation firing commands to the tank gunner and commander.

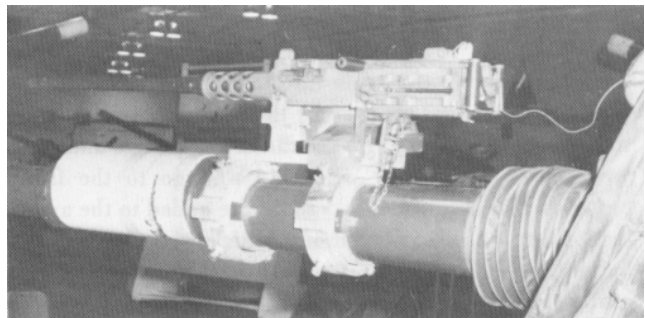
## New Guns For Tankers

There are two new guns in the Armor world — one for training and one for fighting.

The *Telfare Device* is a mounting and firing mechanism to be used for crew training on subcaliber ranges in lieu of main gun firing. Developed by SFC Nathaniel Telfare of the Armor School Weapons Department, the system consists of a .50 caliber M2 machinegun, a firing solenoid, a single-shot device and a kit for strapping the machinegun to the tank's main gun.

**The Armor's new "coax" fires the NATO 7.62 round at a cyclic rate of fire of 780 rpm.**

**The Telfare Device, developed by the Armor School, will assist tank crews in training by providing a subcaliber replacement for the main gun.**

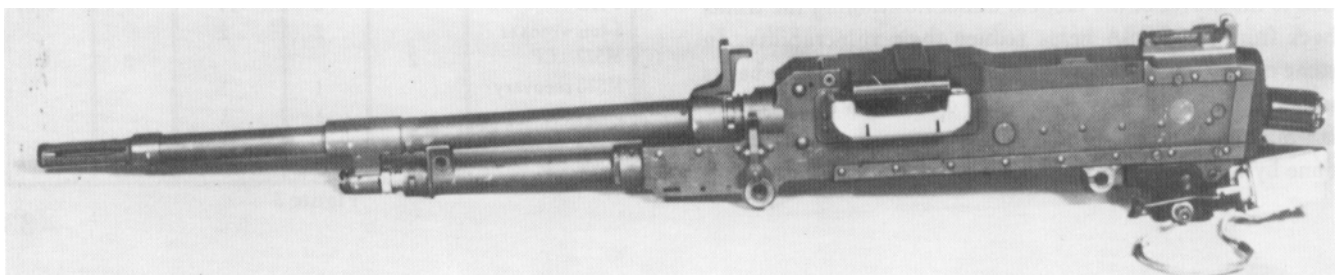


Plans call for the training weapon to fire an armor-piercing incendiary tracer on half-scale ranges. The system is accurate to ranges in excess of 1,600 meters and requires no modification to the tank turret or fire controls. All tank-mounted weapons can now be fired in training and full crew interaction is achieved.

The other weapon is the MAG-58 (*Mitrailleuse A-Gas*), designed by a Belgian firm and used by some other NATO nations. The weapon will replace the M219 and M73 as the coaxially-mounted gun for the US Army main battle tank.

Firing the NATO 7.62 cartridge at a cyclic rate of 780 rounds per minute, the MAG-58 out performed all competitors in testing to select a better coaxially-mounted weapon for US tanks. Reliability and maintainability are the major advantages of this weapon, as well as lower "life cycle" costs.

The MAG-58 is available now and *Armor* magazine reports that sufficient weapons will be available to arm every active tank within two years.



## CDEC Tests Scatterable Mines

The US Army Combat Developments Experimentation Command (CDEC) is conducting major field experiments which center around the "scatterable mine," a comparatively new weapon which can be deployed quickly by firing it as an artillery shell from the Army's conventional guns, such as the 155-mm howitzer.

The artillery round explodes in the air and releases a cluster of mines to scatter on the ground below like pollen from a flower. Unlike the standard land mine which explodes only when it makes physical contact with a heavy force, the scatterable mine contains a magnetic fuze which causes it to explode when a large metallic object, such as a tank, comes nearby. The mine can also be set to self-destruct after a few hours, thus clearing the field.

The scatterable mines, while only five inches in diameter and three inches high, contain enough explosive to destroy a 50-ton tank. The current CDEC tests will provide information for a decision as to whether the Army will adopt the scatterable mine as part of the antitank weapons arsenal.



Moving across open terrain, an M60 tank approaches a minefield during a simulated attack on an opposing force. The unusual bumperlike device at the front picks up signals from simulated mines. The large box on the main guns contain electronic instrumentation for relaying those signals between the tanks and CDEC's computerized data-gathering device.

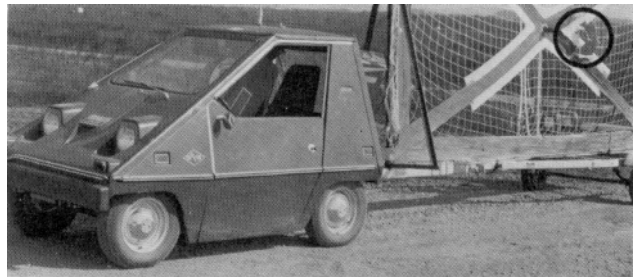
## Shillelagh Missile Scores Hit

A Shillelagh missile, steered by an invisible laser beam and radio-controlled by a man who saw nothing but a television monitor, struck a moving target during a recent test of the Army Missile Command's new laser beamrider.

Proof of the missile's performance was clearly visible — a hole in the mesh-net target.

The test was part of a Redstone Arsenal, AL, research program to demonstrate the new antitank guidance concept and determine the feasibility of a retrofit for Shillelagh missiles.

Thus far, the Army is 10-for-10 against both moving and stationary targets in firings from both the M60A2 tank and the M551 Sheridan vehicle.



Shillelagh "hit" is indicated by the circle.

The laser beamrider program features a guidance technique in which an invisible beam of light is projected at the target and a missile is fired into and rides the beam to the target. The beamrider offers improved performance and reliability, relative immunity to electro-optical countermeasures and simplicity. Hit probability is significantly improved against moving targets at minimum and maximum ranges.

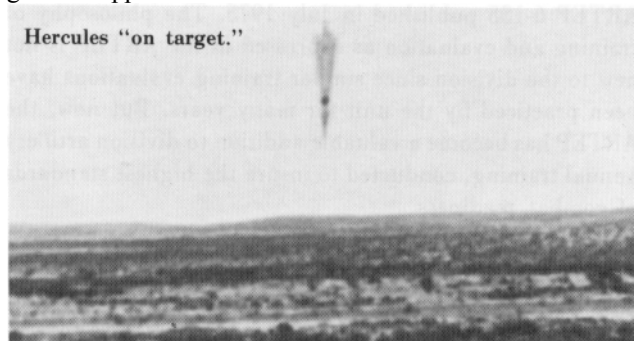
The radio-controlled vehicle used in the test is an electric car, powered by 48 volts, with a top speed of about 30 miles per hour. More advanced beamrider tests, including smoke penetration, defilade firings and firings at short-range moving targets, are planned at Redstone.

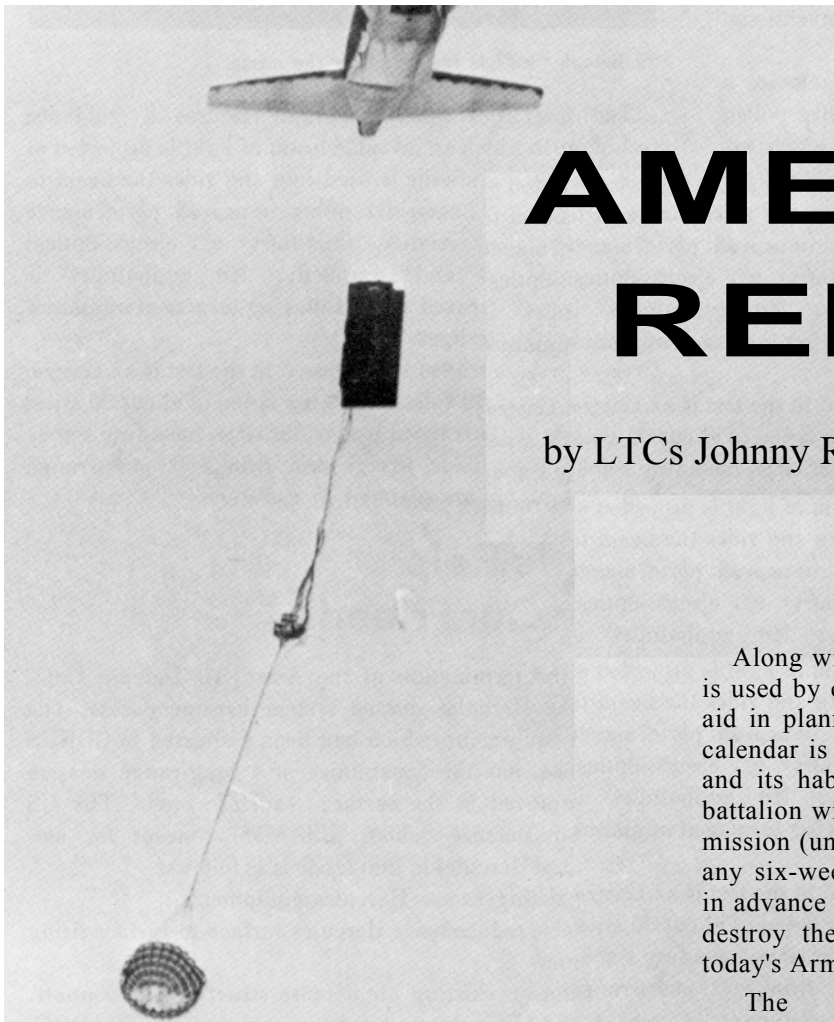
## A Little Help From Our Friends

With the termination of the Army Air Defense Command, the Hercules missile system became excess. The system's equipment, which had been dedicated to CONUS air defense, has the capabilities of a long-range weapon when employed in the surface-to-surface mode. The US Army Air Defense School (USAADS) concept for employment of Hercules in that mode is as follows:

- Use existing excess Hercules equipment.
- Organize reduced-size Hercules surface-to-surface firing batteries.
- Satellite on existing air defense structure for support.

The USAADS concept has been approved by TRADOC, and the School plans to demonstrate the concept's feasibility with a live-fire program during FY 77. A recommendation to field the Hercules surface-to-surface battery has been made, contingent on the success of the program. USAADS envisions that modified Hercules batteries would then be used in corps general support in overseas theaters.





# ALL AMERICAN REDLEGS

by LTCs Johnny R. Hubbard and James E. Walsh

Along with the other training programs, the ARTEP is used by commanders to assess unit readiness and to aid in planning training. The annual division training calendar is divided into six-week cycles. Each brigade and its habitually associated direct support (DS) FA battalion will be conducting either intensified training, mission (unit) training or education and support during any six-week cycle. Planning and scheduling training in advance are two techniques employed by the 82d to destroy the hostile training environment existing in today's Army.

The 82d Airborne Division must be mission-capable 24 hours a day, 365 days a year. For this reason, division artillery is motivated by two basic principles: BE READY TODAY and BE BETTER TOMORROW! Artillerymen must stand ready at all times to provide the division with the fire support and fire support coordination needed to accomplish its current mission. They must also complement and supplement the division's evolving and innovative tactics. Thus, the ability of the airborne battery and battalion to provide responsive and accurate fires and fire support coordination through the fire support teams (FISTs) and fire support officer (FSO) teams becomes the keystone of this mission.

Most of the programs being conducted in division artillery to achieve readiness have evolved from numerous training cycles. No two years are identical since each takes advantage of the previous Year's experiences, as well as new training techniques and tactics.

"5, 4, 3, 2, 1, TOT NOW!" Thus ended the first series of Army Training and Evaluation Programs (ARTEPs) administered to the 82d Airborne Division Artillery battalions at Fort Bragg, NC. The five-day ARTEP had been initiated as an expanded version of the test edition of ARTEP 6-155 published in July 1975. The philosophy of training and evaluation as expressed in the ARTEP is not new to the division since similar training evaluations have been practiced by the unit for many years. But now, the ARTEP has become a valuable addition to division artillery annual training, conducted to insure the highest standards of combat readiness.

## **Focus Of Training**

The thrust of all our training is directed toward the combined arms team. To accomplish combined arms training, the skills of the field artillery battery and battalion are constantly being honed to a fine edge in daily operations with the maneuver units of the division. These skills are continuously evaluated during off-post training exercises, field training exercises (FTXs) and command post exercises (CPXs); however, they are most closely scrutinized technically during the infantry battalion ARTEPs, FA battalion ARTEPs and division artillery readiness training (DART). The final challenges of fire support and coordination skills center on the planning and conduct of combined arms live fire exercises (CALFEXs) and platoon live fire (PLF) exercises with each incorporating "danger close" live fires from mortars, field artillery, TOW, Dragon, close air support (CAS), machineguns, rifles and attack helicopters. The majority of the ammunition is fired in direct support of infantrymen — not at car bodies in restricted impact areas.

## **Off-Post Training Exercises**

Off-post training exercises receive considerable emphasis throughout the training year in the division. Each exercise provides challenges of unfamiliar terrain, different climatic conditions and varying support problems. When the combined arms team, which is normally organized around the infantry battalion, deploys for off-post training, it is accompanied by its normal complement of artillery support; i.e., the habitually associated battery and FIST/FSO teams. Recent unit off-post training has taken place at Fort Bliss, Fort Lewis, Indiantown Gap, Fort Drum, West Point, Eglin AFB and Fort Wainwright. Individual off-post training on a continual basis is conducted at the Jungle Warfare School in Panama and at the Northern Warfare Training Center in Alaska. There is also increasing emphasis on off-post antiarmor training in desert and forested, mid-latitude environments.

## **FTXs And CPXs**

Numerous FTXs and CPXs are conducted each year. Division artillery personnel, especially members of the fire support element, participate in or control these exercises. In all cases, the field artillery emphasis is on maximizing the effective joint fire capability available to the division's maneuver elements. The FIST/FSO communications network is the focal point for providing the brigade's fire support. Since the battle will be fought at the battalion level, it is here that the responsive, detailed coordination of all fire support means must be integrated properly to support most effectively the maneuver elements. All fires (mortar, artillery, tactical air, naval gunfire and attack helicopter) are coordinated and managed by the

FIST and FSO teams for the commander to insure responsiveness, efficiency and accuracy. In addition to the habitually attached FISTs, FSO teams and tactical air control parties, the 2d Air/Naval Gunfire Liaison Company from Camp Lejeune provides the necessary personnel to exercise effectively naval and Marine air, as well as naval gunfire when appropriate.

## **Infantry Battalion ARTEP**

Battery ARTEPs are conducted concurrently with the habitually supported infantry battalion's ARTEP. The nine airborne infantry battalions are currently being evaluated using ARTEP 7-15. Normally the ARTEP is initiated by an alert on Sunday evening and the test, completed Friday afternoon, employs the full range of activities that would be required to deploy a battalion combined arms team to combat. The battery ARTEP is conducted in three phases.

### *Phase I: Pre-deployment Planning*

A battery is attached to an infantry battalion at the time of alert notification and goes through the entire planning process as the maneuver unit prepares for departure. Based on the intelligence available and the commander's estimate and guidance, the FISTs prepare their target lists and the FSO prepares the fire support plan. Concurrently, the battery rigs its equipment for heavy drop. The artillerymen are cross-loaded with the infantry troops and positioned in each aircraft to facilitate landing near their equipment on the drop zone (DZ). The heavy drop takes place a few minutes before the personnel drop. Howitzers are marked with panels for day drops and with lights for night drops to assist the cannoneers in identifying their equipment on the DZ.

### *Phase II: Airborne Assault*

The firing battery personnel prepare for action as soon as they land. Since ammunition is rigged with each howitzer, the battery is prepared to fire its first mission within minutes.

The battery will remain in an attached mode during the early stages of the airborne operation and will fire missions for its habitually associated infantry battalion. The length of attachment depends upon the tactical situation. As soon as practicable the brigade headquarters and DS battalion headquarters are introduced into the problem. The DS FA battalion then assumes control of the battery.

### *Phase III: Revert To DS Battalion Control*

During this phase the battery is deployed to provide the most responsive fires to its supported unit. Suppressive fires and dedicated battery techniques, as well as gunnery and firing battery operations, are evaluated.

Throughout this evaluation, the major thrust centers on the close working relationship between the infantry and field artillery, especially between the company commander and the FIST. The battery commander and battalion FSO coordinate closely and continuously with the infantry

battalion commander and his staff to insure that the important mutual interdependence required for survival in combat is maintained. A knowledgeable and well-trained infantryman always maneuvers inside the range of his responsive artillery fires. The artilleryman coordinates position locations to take maximum advantage of the security provided by the maneuver element while maintaining the capability of accurate and timely fire support.

Highlights of the battery ARTEP conducted during the infantry battalion ARTEP include day and night live fire air assaults, live fire movement to contact (dedicated battery) and the antiarmor defense.

The evaluation concludes with a tactical requirement for the employment of the artillerymen as infantrymen where basic infantry skills are reinforced. The exercise terminates with live firing of individual and crew-served weapons which serves as a check of field maintenance.

### **FA Battalion ARTEP**

The FA battalion ARTEPs are conducted at Fort Bragg, taking advantage of the multiple DZs and superior firing ranges there. The ARTEP is initiated by a battalion

emergency deployment alert notification. The normal deployment sequence is followed. After the alert, issuing plans and orders and rigging of the vehicles and howitzers for heavy drop are the primary activities conducted during the first 18 hours. On D-Day, P-Hour, the field training portion of the ARTEP is initiated by an airborne assault on multiple DZs. ARTEP 6-155 and the new concepts and tactics developed by the Field Artillery School are adhered to throughout the exercise. The ARTEP is conducted in three phases.

#### *Phase I: Decentralized — Airborne Assault And Initial Objective Area Operations*

The scenario calls for each infantry battalion, with its attached artillery battery and FIST/FSO teams, to parachute assault personnel and equipment on three different DZs to support separate infantry battalion objective areas. During this period the FA battalion operates in a decentralized role. An infantry company with its FIST jumps with one of the FA batteries and immediately conducts a movement to contact at which time the FA battery is placed in a dedicated battery role. The battery then fires a





series of danger close suppressive fires as the company moves to contact through the impact area. The company establishes a defense and the battery fires defensive fires and final protective fires. Meanwhile, the other FISTs are calling in fire missions to the remaining two batteries. Periodically a target is developed which requires the battalion to mass its fires from battery positions dispersed over a distance of 15 kilometers. This initial phase, during which the battalion headquarters has limited control, lasts approximately 24 hours.

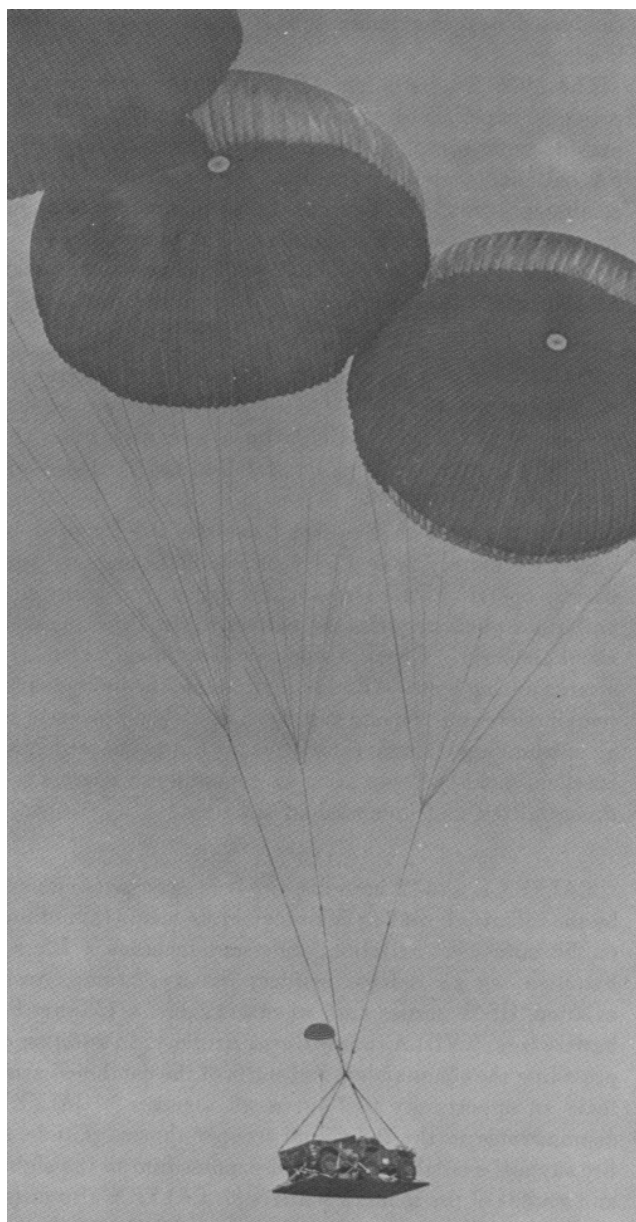
#### *Phase II: Transition*

On D + 1 the tactical situation remains very fluid. The infantry battalion objective areas are expanded, and linkup between individual units is accomplished. To provide fire support during this rapidly changing situation, the batteries are required to move to alternate positions, conduct airmobile moves and emergency occupations, and conduct two-gun direct and indirect fire airmobile raids using UH-1H helicopters. By 1600 hours on D + 1 the objective areas have been merged. At this point the FA battalion assumes full control of the batteries, operating in a more centralized DS role.

Throughout this transitional phase, logistical requirements have been met by follow-on and emergency resupply using the Container Delivery System, a technique which makes it possible to deliver 16 one-ton bundles by parachute from a C-130 aircraft into an area the size of a football field. Depending on the scenario and the availability of assault airstrips, actual air-land operations will be initiated as soon as practicable. If an air-land operation is not feasible, additional heavy equipment, weapons and vehicles may be introduced into the objective area by using the Low Altitude Parachute Extraction System which is employed when a relatively level, 200-meter strip is available. The load is rigged on a platform and is extracted as the C-130 flies at low level over the short strip. The probability of weather cancelling or delaying these activities (to include the initial assault) has been greatly reduced by the Adverse Weather Air Delivery System (AWADS) which enables the troop aircraft to pinpoint the DZ through a series of homing devices. AWADS provides the capability of conducting parachute assaults under near zero visibility conditions.

#### *Phase III: DS FA Battalion Operations*

In this phase the battalion functions in a more conventional mode with the complete realm of tactical and technical requirements outlined in ARTEP 6-155. Prior to dark on D + 1, one gun from the battalion is sent forward to conduct an offset registration. Later the battalion(-) conducts a full-scale night airmobile displacement to forward positions to support a major attack on D + 1. The attack commences at 0700 hours with a full-scale preparation and supporting fires. Throughout the day the



FA battalion is required to fire a wide variety of missions geared to determining the responsiveness of fires.

#### **FA Battalion ARTEP Summary**

Each ARTEP conducted in division artillery challenged the battalions' and batteries' ability to move, shoot and communicate. Numerous moves were made to keep leadership energized. In addition to entering the exercise by parachute, each battery was required to move every six hours either by road or air. From the shooting viewpoint, each fire direction officer was extensively exercised. A total of 35 battery and 15 battalion missions were fired.

Initially, communications between FDCs and forward observers (FOs) were a real challenge. Missions were being

conducted near maximum ranges of the radios and the howitzers.

The 1976 FA battalion ARTEPs have been built on previous experiences and lessons learned in 1975. To provide more complete training and evaluation of the DS FA battalion's ability to support the maneuver units, a combined arms ARTEP has been planned which incorporates the conduct of an infantry battalion ARTEP, a field artillery battalion ARTEP and an aviation battalion ARTEP simultaneously within the same scenario.

### **DART**

DART provides a rapid, efficient means of quickly evaluating the individual battery. These exercises are conducted by division artillery on a no-notice basis and require a battery to conduct a full-blown, independent three-day exercise. The fast-paced 18-hour live firing segment begins with live fire from the DZ followed by numerous battery moves by vehicle and helicopter. Split battery operations are stressed throughout. A challenging antiarmor phase requires the battery to fire three missions simultaneously. Chemical-biological-radiological (CBR) attacks during hours of darkness stimulate the individual to remain alert and respond rapidly. DART has proven to be an outstanding training vehicle for the battery as well as an excellent means of evaluating its capability to operate in a decentralized and independent situation.

### **CALFEX**

CALFEX is a 24-28 hour live fire field exercise conducted by the infantry battalion combined arms team. In addition to the maneuver battalion, the team includes a DS FA battalion, an air defense artillery battery, armor, Army aviation, USAF sorties and, when available, a 155-mm FA battery from XVIII Airborne Corps Artillery. In addition to providing the commanders and staffs of the combined arms team an opportunity to "put it all together," CALFEX demonstrates to the individual trooper the magnitude of fire support available to him and exposes him to the sights and sounds of the modern battlefield. CALFEX also offers challenges to the small unit leaders, most of whom have not been exposed to combat. The exercise is conducted in seven phases.

#### *Phase I: Capabilities Exercise*

CALFEX begins with a capabilities exercise designed to show the troops the fire support available to the combined arms team. The infantry battalion commander is the narrator and explains the nature and purpose of each fire support means. The weapons demonstrated (all live fire) are 81-mm and 4.2-inch mortars, 105-mm and 155-mm howitzers, attack helicopters and tactical air. To demonstrate how fire support systems are to be integrated, all of the weapons are coordinated and fired 800 meters in front of the troops as an objective preparation for a live air assault. The coordinated preparation is brief, violent and

continuous. The first lift ship touches down no later than 10 seconds after the impact of the last preparation round. Door gunners in the lift ships continue to fire to suppress any remaining enemy in the objective area.

#### *Phase II: Approach March And Infiltration Course*

After the capabilities exercise, the battalion conducts a tactical approach march to the line of departure for the coordinated attack. En route, the battalion negotiates an infiltration course under live fire. The lead company and an engineer platoon run the course first and then move to breach a minefield.

Everyone goes through the infiltration course. Division field artillerymen complete the course at least once every training year.

#### *Phase III: Coordinated Attack*

During Phase III, the battalion conducts a coordinated attack to seize an objective. The attack commences with a live tactical air, field artillery and mortar preparation. During the movement to the objective, the infantry uses the "bounding overwatch" technique. Live fire "danger close" missions support the attack and destroy pockets of enemy resistance. The DS artillery battery is placed in a dedicated role and conducts numerous suppressive fire missions en route to the final objective. Normally two infantry companies are involved, each having a dedicated battery. As the troops take the objective, supporting fires are shifted to blocking positions.

#### *Phase IV: Night Defense*

Next, the infantry battalion prepares for defense by digging in with overhead cover, emplacing live claymore mines and issuing live ammunition. Platoon FOs adjust in the artillery and mortar final protective fires.

#### *Phase V: Night Illuminated Attack*

The battalion is then given a new mission and prepares to conduct an illuminated night attack. Prior to the final assault, a short and violent artillery preparation neutralizes the objective. Mortars provide the illumination necessary for the assaulting troopers, while the artillery provides the preparation and blocking fires.

#### *Phase VI: Night Live Air Assault*

Once the battalion secures and consolidates the objective, the reserve company is ordered to conduct a night live fire air assault to secure key terrain 10 kilometers away.

The backward planning must be done rapidly and accurately. Once the ground plan is complete, the FSO presents a fire support plan for the maneuver commander's approval. The plan is designed to provide security for the pick-up zone, neutralize enemy along the flight route and in the objective area and block the enemy from moving toward the objective. The level of combat power developed by fire support in the objective area must remain high until the maneuver troops are firmly established on the objective.

Next, the FSO must coordinate the fire plan with the field artillery, CAS and lift and attack helicopters to insure that each person understands his role and the timing involved.

During the final 10 minutes of the air assault, the FSO sits beside the maneuver commander in the command and control ship and controls the timing of the preparatory fires. All agencies monitor the artillery fire direction net.

#### *Phase VII: Live Fire Air Assault*

Prior to dawn the battalion(-) conducts an approach march to a pick-up zone in preparation for live fire air assaults on two objectives. Again, each objective is prepared by artillery, CAS and attack helicopters with the side door gunners firing as each helicopter lands. The exercise is terminated when the objectives are secured.

#### **PLF Exercises**

PLFs conducted by each infantry/cavalry platoon in the division provide an opportunity for the platoon to be the focal point of the combined arms team. The PLF is similar to CALFEX from the live fire view, except on a smaller scale and with some mission differences.

#### **Live Fire Summary**

Live fire exercises, CALFEXs and PLFs provide an opportunity for the combined arms team to practice what must be done perfectly the first time to win the first battle of the next war. There will be no time for last minute honing of skills. Live fire exercises in the peacetime environment provide the sights and sounds of the modern battlefield without the loss of life.

The combined arms team is losing small unit leaders with combat experience through service termination and promotion. In light of this fact, CALFEX and PLF serve as ideal training vehicles for the new small unit leaders.

#### **Other Training Activities**

Many other training activities are conducted to insure constant states of readiness in individual batteries and battalions. Some of these are fire support seminars, howitzer section tests and gunner's tests.

Monthly fire support seminars are conducted for all FIST leaders, FSOs and S3s. The primary purpose of these seminars is to improve the knowledge, training and overall staff capabilities of the FSO, the key link between the infantry battalion commander and his fire support agencies.

Professionalism and safety demand that his job be done flawlessly. The infantry battalion commander trusts the FSO to coordinate all supporting fires safely and responsively. The FSO must be knowledgeable, decisive and highly trained. The seminars insure that each FSO and FIST leader is equipped with the most recent information and lessons learned and new fire support techniques.

The howitzer section test is conducted to evaluate the collective skills of howitzer sections. These skills include navigation, CBR, road marches, maintenance and gunnery techniques (including direct and indirect fire missions, emergency missions and "killer junior" methods).

The gunner's test conducted by each battalion evaluates the individual skills of the howitzer crew members. Not only does the gunner's test provide each section chief with the status of individual training within his section but it also evaluates the effectiveness of the battery training program, thus giving the commander a starting point for the performance-oriented training.

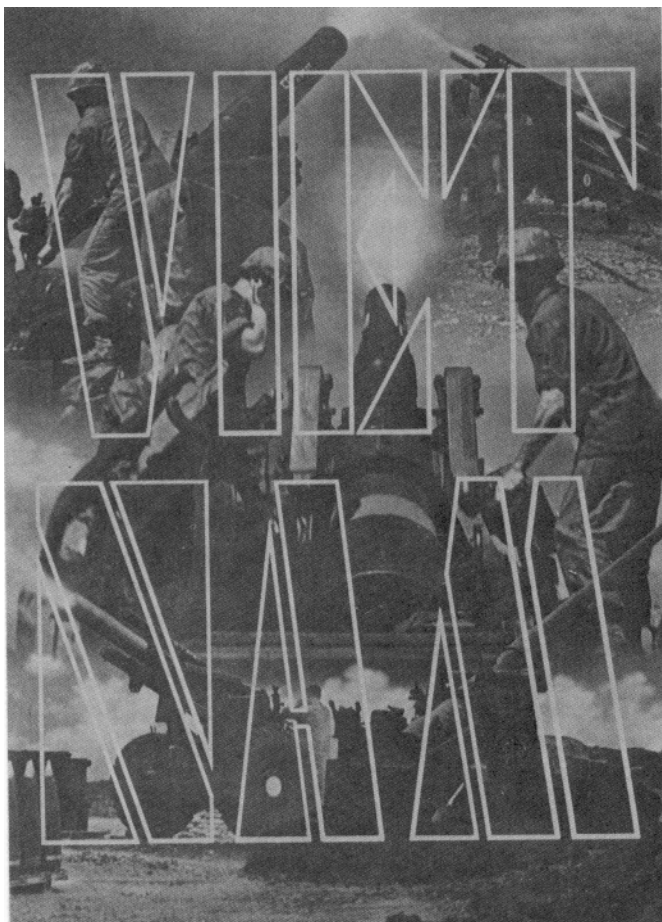
#### **Summary**

Every training vehicle discussed is used by the 82d Airborne Division Artillery to maintain its state of readiness. The evaluations conducted on the ARTEPs and the lessons learned on the CALFEX are used to determine weak areas. Corrective training is initiated when any deficiency is detected. New personnel are integrated into their respective positions and get "on board" through personal research and on-the-job training. Whenever possible, critical positions are planned to overlap with the incumbent to take full advantage of the acquired experience and institutional memory.

The high state of readiness for which the division is recognized is attributable to each individual's capability used collectively. The unique nature of the airborne periodically challenges each individual to demonstrate his personal proficiency by performing a successful parachute jump. This task continually reinforces the individual's positive attitude. This attitude enables the gunnery team to respond rapidly to proper guidance and correction of any weakness that might be present in the field artillery system. This same pervasive feeling is used continuously to forge new ideas and to improve on current techniques. ☒

**LTC Johnny R. Hubbard, FA, is S3 of the 82d Airborne Division Artillery; and, LTC James E. Walsh, FA, is Commander, 1st Battalion (Airborne), 319th Field Artillery.**

## Part VI Vietnamization (continued)



# 1972 Enemy Offensive

by LTG David E. Off

In mid-1971, shortly after the conclusion of LAM SON 719, Military Assistance Command redeployed the 1st Brigade of the 5th Infantry Division and thus removed the last American maneuver unit from the demilitarized zone. Artillery units of the 108th Artillery Group, however, remained because Vietnamese forces still desperately needed artillery assets. To fill the void created by the withdrawal of the American forces, the Joint General Staff activated the Vietnamese Division. This unit was a conglomeration of independent units already operating in Military Region (MR) I and newly created units still being trained and outfitted.

Overall, 1971 was a wait-and-see year. More and more responsibility was given to Vietnamese units, and their performance was evaluated. Although, operationally, their performance was spotty, there were some hopeful indicators. Territorial artillery assumed greater fire support responsibilities, and by year's end 100 platoons had been deployed. The Artillery School continued to revamp and upgrade its program to include initiation of the artillery officer's advance course in August. In some divisions, the artillery began to assume traditional support roles and develop habitual support relationships with the maneuver regiments. By December, deployed Vietnamese artillery strength had increased to 1,202 tubes of various calibers, including twelve 175-mm guns.

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### ARVN Artillery Posture 31 December 1971

Unit	Authorized	Activated	Deployed
105-mm bn	41	41	40
155-mm bn		15	15
175-mm bn (separate)	2	2	1
Sector artillery platoon (105-mm)	176	135	100

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By mid-December 1971, intelligence sources were beginning to note increased enemy activity along the Ho Chi Minh Trail and in the demilitarized zone area of Vietnam. As this buildup continued and a pattern of sorts developed, American and Vietnamese commanders began warning their commands to prepare for a major enemy offensive commencing with the Tet holidays in mid-February. American leaders believed that the expected offensive would be the greatest test of Vietnamization, perhaps with the preservation of the entire nation at stake.

Tet passed with no significant increase in enemy action. Allied commanders continued to expect an attack, but the vigilance and readiness established for the holidays could not be maintained. As the days after Tet slipped by without action, the nervous edge of the troops faded and daily



routine returned to normal. Then, on 30 March 1972, the North Vietnamese launched an infantry-armor attack through the east central portion of the demilitarized zone against the fire bases defended by elements of the 3d Division. The North Vietnamese units quickly routed the defending forces and slashed forward toward Dong Ha, which fell with little resistance. Farther south in MR I, the North Vietnamese attacked from Laos and by 14 April had captured Fire Support Base BASTOGNE and were threatening Hue. Meanwhile, in MR III, Communist forces launched their An Loc campaign on 1 April by overrunning Fire Support Base PACE, 35 kilometers northwest of Tay Ninh city. On 5 April, the North Vietnamese attacked Loc Ninh and controlled the city by the next morning. The withdrawing South Vietnamese forces sustained heavy casualties as they moved south on Route 13. By this time General Minh, commander of III Corps, realized that the main enemy effort would be in Binh Long Province and quickly reinforced An Loc. On 10 April, the anticipated offensive began. The North Vietnamese 9th Division, supported by armor elements, attacked An Loc.

In MR II, the initial enemy action was limited to increased harrassing tactics, interdiction of Route 14 at the Kontum Pass and the successful closing of the An Khe Pass on Route 19 on 11 April 1972.

Action in the Mekong Delta was negligible.

Early in the offensive, some of the objectives of the coordinated attacks throughout the Republic of Vietnam became apparent:

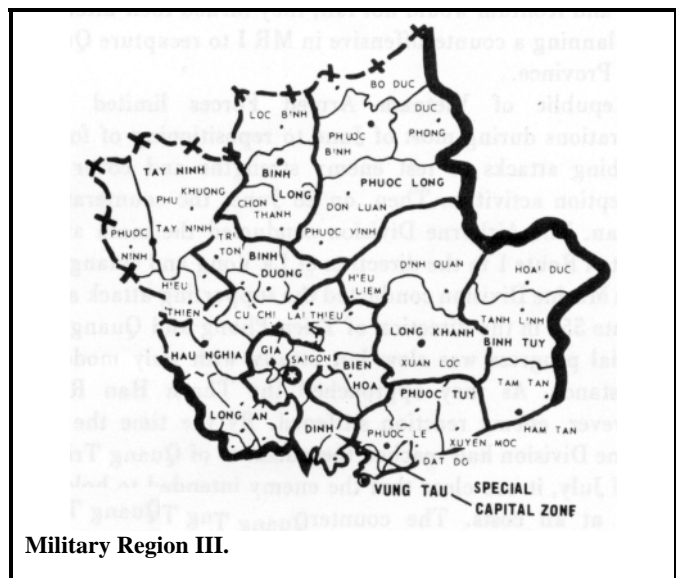
- 1) To divide the national reserves and force piecemeal, indecisive commitment of these forces.
- 2) To give the impression of greater strength by attacking on several fronts.
- 3) To promote a lack of decisiveness on a South Vietnamese command structure, faced with few clear-cut options and several ominous situations.

4) To encourage widespread dissatisfaction with the government of Vietnam by demonstrating its inability to protect its people.

The strategy of the enemy centered on the provincial capitals. These cities were focal points due to their governmental prominence, their relative isolation and their comparatively weak defenses. It also became clear that the ultimate objective of the North Vietnamese was the capture of Quang Tri, Qui Nhon, Kontum, An Loc, Tay Ninh and Hue. The loss of these cities could well have precipitated the collapse of the South Vietnam government.

The first two weeks of the offensive were disastrous for the South Vietnamese forces. Throughout the country they experienced heavy personnel losses, had to face infantry and armor attacks in significant numbers for the first time and often (especially in MR I) found themselves outgunned by enemy artillery. During the first 10 days of the Nguyen Hue offensive, South Vietnamese units lost eighty-one 105-mm howitzers, thirty-two 155-mm howitzers and four 175-mm guns. Most of their losses were due to reliance on aircraft for fire base evacuation and the inability of the aircraft to do the job because of enemy artillery. In MR I, two battalions of the 3d Division lost all their guns and another battalion escaped similar fate only because it was still in training and only partially deployed. All the fire support bases north and west of Dong Ha were overrun and the artillery positioned there was captured or destroyed. Artillery losses throughout the remainder of South Vietnam were fewer only because units were more widely deployed.

Throughout April and May the North Vietnamese Army continued to apply pressure along all the fronts. In MR I, enemy units attacked and captured Quang Tri in early May. In MR II, the drive in the highlands began on 23 April. In quick succession, Fire Support Bases 5 and 6, Tanh Canh and Dak To, fell and northwestern Kontum



**ARVN Artillery Losses  
31 March-10 April 1972**

	<b>Caliber</b>	<b>Number of Weapons Lost</b>
Military	105-mm	47
Region I	155-mm	18
	175-mm	4
Military	105-mm	2
Region II	155-mm	2
Military	105-mm	26
Region III	155-mm	8
Military	105-mm	8
Region IV	155-mm	2

Province was in enemy hands. In MR III, An Loc remained under pressure, Dau Tieng suffered attacks and the interdiction of Route 13 continued.

As these actions occurred, South Vietnamese forces began to regroup. They stiffened their resistance to enemy pressure and, with the aid of massive air support, slowed the momentum of the enemy thrust. During May, the action began to stabilize as ARVN forces established a defensive line along the My Chanh River in MR I, stopped the enemy at Kontum and stubbornly resisted at An Loc. Although enemy pressure remained great throughout May, the thrust of the offensive had been blunted and never regained its force. Throughout the counter offensive that followed, opportune application of artillery and air power prohibited enemy buildups and attacks.

The late May stabilization permitted South Vietnamese commanders to scrutinize carefully the overall situation and take appropriate actions. When it became apparent that An Loc and Kontum would not fall, they turned their attention to planning a counteroffensive in MR I to recapture Quang Tri Province.

Republic of Vietnam Armed Forces limited their operations during most of June to repositioning of forces, probing attacks to test enemy strengths and cover and deception activities. Then, on 28 June, the counterattack began. The Airborne Division conducted the main attack west of Route 1 in the direction of La Vong and Quang Tri. The Marine Division conducted the supporting attack along Route 555 in the direction of Trien Phong and Quang Tri. Initial progress was slow but steady with only moderate resistance. As they approached the Thach Han River, however, enemy reaction stiffened. By the time the Airborne Division had reached the outskirts of Quang Tri city on 7 July, it was clear that the enemy intended to hold the city at all costs. The counterattack ground to a halt. Although the initial plan called for Quang Tri to be

bypassed, recapture of the city now became an emotional national objective.

Success during August continued to be limited, and it was not until early September that the final phase of the Quang Tri battle began. Then the marines launched the final push against the citadel within the city. On 11 September 1972, the marines succeeded in breaching the citadel wall and gained control of the citadel on 16 September. By nightfall on the 17th the city belonged to the Marine Division. Activity now shifted to the area of operation of the Airborne Division as they drove to capture Fire Support Base BARBARA. Their efforts were hampered by heavy attacks by fire and deteriorating weather as the October monsoon began to bring its heavy rains. However, by the end of October, the base was recaptured and the major tasks of the counteroffensive were accomplished.

The employment of artillery in support of the counteroffensive in MR I gradually evolved from the fire base concept to conventional tactics. This change resulted from the introduction of 122-mm and 130-mm artillery weapons by the enemy and the effective use of these weapons against fixed fire bases. Although artillery contributed extensively to the success of the combat operations, poor artillery procedures were evident in all units. The failure to survey, register and apply meteorological data and improper ammunition-handling procedures reduced the accuracy of artillery fire. Further, a tendency to substitute massive unobserved fires for less intense observed fires resulted in excessive ammunition expenditures. At the same time, the development of the I Corps fire support element at Hue during May 1972 enabled I Corps, for the first time, to integrate all US and Vietnamese fire support means. The fire support element worked extremely well and contributed substantially to the success of the I Corps operation.

### **Problems During Phase-down Of US Forces**

The massive emphasis given so suddenly to Vietnamization caused a variety of feelings among the Republic of Vietnam Armed Forces leaders. These feelings became more and more verbal. In connection with an assessment of the Vietnamization effort, II Field Force, Vietnam, indicated: "To most senior ARVN commanders, Vietnamization has provided the motivation . . . to assume the responsibility for the defense of their country in as short a time as possible. Many of these responsible individuals also express concern lest the Vietnamization process move too



**D44, 85-mm gun.**

rapidly, leaving them to face a determined and waiting enemy before they are fully ready. Other responsible ARVN officers are optimistic about ARVN combat units taking over now . . . but they emphasize the continued need for US combat support (helicopter, artillery, etc.) and logistics support . . . until these ARVN capabilities are fully built-up."

Even as Vietnamese leaders were expressing anxiety over the relatively high speed of the Vietnamization programs, American commanders began experiencing operational difficulties caused by redeployments, standdowns and space reductions. To counter these problems, comprehensive studies were conducted to discern the most efficient utilization of the remaining assets. These studies revealed gaps in artillery coverage, poor utilization of heavy artillery capability and unsatisfactory positioning of light artillery. The best example of the results of such a study was Operation METRO MEDIA executed by I Field Force Artillery (FFA). Between January and March 1970, more than 17 complete relocations of artillery battalion headquarters and subordinate elements were conducted. The moves resulted in I FFA assets being positioned most effectively to accomplish the required support mission. Better utilization of heavy artillery's long-range capability was realized and a quick-reaction artillery force was created in the central portion of MR II.

Further problems were generated by the actual redeployment of artillery units. Since withdrawal plans and Vietnamization programs did not emanate from the same source, more often than not the administrative considerations of standdown clashed with the tactical requirements of the commands affected by redeployment. Often, artillery coverage was not immediately available to

replace that provided by the recalled elements and a short-fuzed shuffle of the remaining artillery assets ensued. The lack of adequate fire support tended to lower the effectiveness of offensive operations. The withdrawal of the 9th Infantry Division from MR IV is a good example of this loss of firepower. The movement of the division from the Mekong Delta caused an immediate loss of three artillery battalions. Even when all the artillery with the Vietnamese 7th Division became operational, there was a net loss of two artillery battalions, and the addition of two battalions to IV Corps assets was insufficient to upgrade the artillery posture of the upper delta without affecting other portions of IV Corps Tactical Zone. Additional hardships resulted from the lack of experience by which to gauge the time requirements of standdown. The effort to insure optimum artillery coverage for the longest time often placed inordinately heavy administrative requirements on the redeploying units.

The time squeeze was most apparent in personnel matters. Transfers within the country and tour-completion requirements posed difficulties. In addition, early stand-down cut into the active artillery posture, forced hasty repositioning and, at times, affected offensive operations in progress. At the same time, early standdown caused administrative problems by leaving units with no equipment, no mission and no motivation — a situation ready-made for racial tensions, drug incidents and morale problems.

An additional problem that affected artillery units was the far-flung deployment of some firing elements. This widespread positioning prevented the battalion headquarters from effectively controlling the standdown of their batteries. To overcome this situation, higher headquarters directed battalions in the same locale as the

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**Ammunition storage facilities. (Photo by SP5 Don Mechum.)**



isolated unit to assist the battery during standdown operations. The assisting battalion was not staffed to absorb the added workload.

As redeployment progressed, experience factors were established, most of the administrative hardships were overcome and a general system was developed. The tactical difficulties, however, remained and often grew. Because of the technical and personnel limitations, Vietnamization in certain areas of the country lagged the pace of the American withdrawal programs.

With the introduction of tube artillery by the enemy during the Nguyen Hue offensive, the weakness of South Vietnamese target acquisition means and counterbattery techniques became apparent. This inability to produce lucrative artillery targets was compounded by the consistent ability of enemy artillery to outrange South Vietnamese artillery and thus make counterbattery fires almost impossible. To offset this weakness the Field Artillery School at Fort Sill sent teams to Vietnam to aid in target acquisition, with emphasis on the counterbattery program. The teams arrived in Vietnam on 21 May 1972 and deployed to the field two days later. Their success depended on the specific needs of each South Vietnamese division — its mission, its degree of involvement with the North Vietnamese offensive and the attitude of its commanders. The teams were fairly successful in helping to establish counterbattery intelligence centers, especially in I Corps where units were heavily committed to combat operations against North Vietnamese forces.

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#### **Enemy Artillery Employed During Nguyen Hue Offensive**

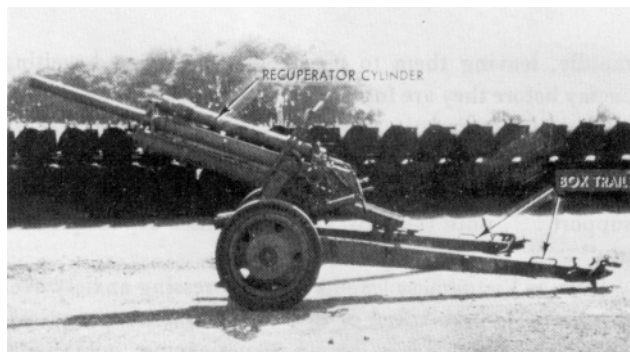
M46 130-mm gun  
D74 122-mm gun  
M38 122-mm howitzer  
A19 122-mm gun  
M44 100-mm gun  
D44 85-mm gun  
ZIS3 76-mm gun

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The following results highlighted some of the target acquisition efforts of the target assistant teams and South Vietnamese units: The 18th Division acquired 178 confirmed targets over a 17-day period; the 21st Division destroyed six howitzers; and, I Corps destroyed eleven 130-mm guns, two 122-mm weapons and ammunition storage areas.

However, the main source of targeting information concerning hostile armor and artillery weapons continued to come from airborne visual and electronic observation conducted by US Army and Air Force resources.

The Fort Sill teams' report on the state of Vietnamization concluded that the Vietnamese Artillery School performed



**ZIS3, 76-mm howitzer.**

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its mission in an outstanding manner and its curriculum incorporated sufficient instruction in target acquisition. The inadequacies in the proper employment of counterbattery tactics and techniques appeared to be generated in the field. Units such as the Vietnamese 25th and 1st Divisions had personnel knowledgeable in counterbattery procedures but saw no need to employ counterbattery tactics and techniques. "They entertained," the teams reported, "no real sense of urgency." This neglect led to deterioration and eventual inability to employ effective counterbattery programs. The teams observed that the units required strong ARVN command emphasis with corresponding advisory follow-up. The solution, then, seemed to lie not with more instruction but with constant supervision. Here, in microcosm, was the dilemma of the entire Vietnamization program. The US Army units in Vietnam had to support maneuver elements and simultaneously supply the drive behind Vietnamization. Personnel problems alone often destined the latter task to be secondary. And, without full-time support, the Vietnamese failed to perceive the necessity of certain procedures. Consequently, they remained dependent on American aid.

The teams also provided valuable information concerning North Vietnamese Army artillery employment methods. Their analysis indicated that the North Vietnamese artillerymen were extremely professional and capable. The gunners generally fired at optimum range and preferred to mass widely separate pieces in surprise fires. Their ability to use artillery in this manner indicated that they surveyed gun positions, established effective communication systems and exercised centralized control of fires.

On the other hand, the Fort Sill teams found that South Vietnamese artillerymen still ignored basic requirements necessary for effective fire support. ARVN artillery units did not conduct registrations and limited survey functions to using the existing survey established by American units prior to redeployment. Moreover, all South Vietnamese units except the 1st Division ignored meteorological data. For these reasons, it became apparent that, although artillery fires normally were available, Vietnamese commanders



preferred to call on tactical air assets to neutralize targets.

Although the Nguyen Hue offensive remained in the forefront throughout most of 1972, Vietnamization continued. During August, September and October, the activation of three 175-mm gun battalions marked the completion of the Project ENHANCE schedule. The Army of the Republic of Vietnam projected the employment of these battalions in MRs I, II and III. Of these units, the 104th Artillery Battalion was the first to receive guns supplied directly from the United States rather than guns transferred within the country from departing American units.

The South Vietnamese Artillery School initiated a systems engineering approach in the structuring of programs of instruction. A thorough program of briefings and discussion insured that key personnel understood the systems engineering concept and that continuity would be maintained if key personnel were transferred. The school added classes in crater analysis and target acquisition for cadre personnel from the various branch schools and training centers throughout Vietnam. These classes were to be a base for similar courses at these various places.

Facilities at the Artillery School remained inadequate. There were only 14 classrooms. When these were filled, classes were held in other facilities or on the parade field. The school submitted a compound improvement construction plan on four occasions — the last in October 1972 — but received no replies.

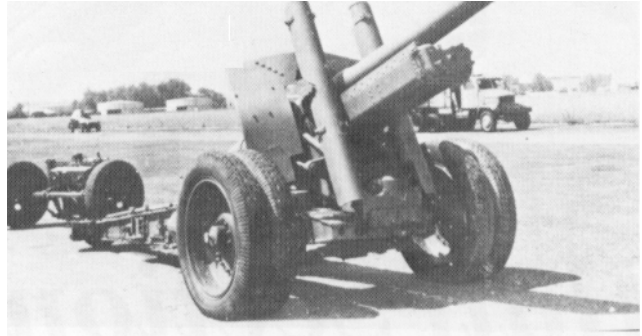
A revised table of organization and equipment would have increased the instructor force level adequately to support the student population. Submitted some 18 months before, the new document had not been approved in late 1972.

Despite these shortcomings, the school managed to provide the basic training required to establish the foundation for South Vietnamese artillery. On 20-21 December 1972, the Field Liaison Directorate, Liaison and Inspection Team, evaluated the school and gave it a good rating.

From October 1972 until the cease-fire in early 1973, the entire scope of the war changed. As peace rumors increased, combat action rose. Both sides began final "land-grabbing and flag-raising operations." Vietnamization became primarily a logistical exercise in an attempt to stockpile as much equipment in Vietnam as possible. For all practical purposes, the active Vietnamization program had ended.


With the signing of the cease-fire on 25 February 1973 and its effective date on 28 February 1973, the United States involvement in Vietnam came to an end. During the last three years of that involvement, efforts were concentrated on preparing the Vietnamese to defend their country without active American participation. An assessment of that effort would show that despite the

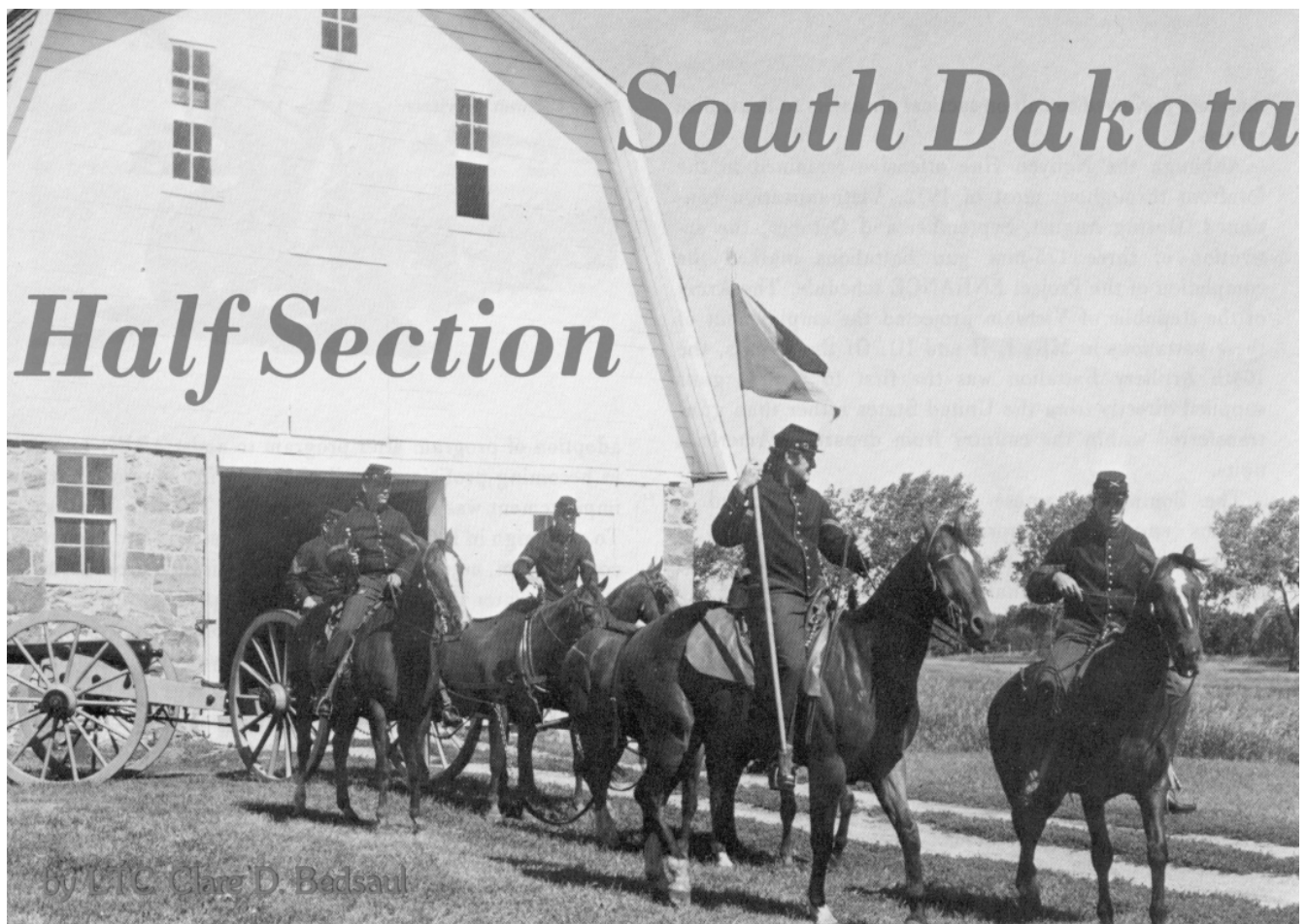
**A19, 122-mm howitzer.**



adoption of program after program to assist ARVN forces in becoming proficient in all phases of fire support, little improvement was to be seen in combat. The Ben Het-Dak To campaign in 1969 pointed out weaknesses in fire support coordination, adjustment of fire and clearance procedures. One year later the same weaknesses appeared during the Cambodian incursion. The LAM SON 719 operation in 1971 did not change the picture, and the Nguyen Hue campaign during 1972 added technical shortcomings to the fire coordination weaknesses noted in the earlier actions. In addition, surveys conducted throughout Vietnam during the period continued to show that Vietnamese forces ignored advanced gunnery procedures.

In retrospect, it is apparent that in almost all the field artillery programs that were cited as successful during the Vietnamization period, American units were actively involved, providing labor and materiel. The Vietnamese were merely recipients of a service. It can be argued that, by providing the major impetus to the Vietnamization program, the Americans doomed the program to marginal success at best; the American command failed to involve the Vietnamese actively and therefore failed to teach them how to perform the work themselves or convince them of the program's value.

But the American command was in a quandry. Senior commanders were certainly intelligent enough to foresee the disadvantages of allowing American units to do the work while the Vietnamese sat idly by. On the other hand, much had to be accomplished in a brief time. Any adviser could attest that it took time to convince ARVN commanders that an improvement was needed and to show them how to carry it out. If US programs were to be successful, they would at least have to be implemented and, restricted by time, Americans would have to furnish the major impetus. Then the Vietnamese could at least be exposed to those techniques necessary to provide the best fire support possible. With American airpower denied them, Vietnamese forces would turn more and more to their artillery to fill the gap in firepower. To provide this support, the artillery hopefully would be forced to utilize the techniques to which they were exposed during Vietnamization. Whether in fact they did is, of course, the question. 



With the advent of the Spanish-American War in the spring of 1898, Congress authorized the formation of a component in addition to the Regular Army called the Volunteer Army of the United States. Although this force was formed from existing organized militia units from throughout the States, participation was strictly on a volunteer basis and did not constitute a mobilization of forces as it is known today.

Within the young State of South Dakota, President McKinley's call to arms gained the response of the entire First Infantry Regiment of the State's National Guard. The only artillery battery in the Guard came from the town of Clark. Armed with two obsolete 3-inch guns, muzzleloading antiques of the Civil War, the Clark Battery accompanied the regiment on its journey to Sioux Falls, SD, in response to the President's call. Upon arrival, the artillerymen from Clark were informed that, due to their outdated weapons, they would be acceptable for service only as infantry. Faced with this ultimatum, the men of the Clark Battery retorted indignantly that they were artillerymen and returned home — the only unit of the State's First Infantry Regiment not serving in the Spanish-American War.

Although this event may not display the ultimate in soldierly discipline, it does portray the often freewheeling

spirit of the National Guard, as well as the intense pride of professional artillerymen. In recognition of this pride, the 147th Field Artillery Group, a South Dakota Army National Guard unit with service dating back to World War I, chose to reconstitute a horse drawn artillery piece from the old Clark Battery. This was to be the unit's contribution to the nation's bicentennial observance.

The project required almost two years of frustrations and hard work by volunteer members of the 147th Headquarters Battery located in Pierre, SD. In a predominately ranchland area where a large percentage of the population is "born to the saddle," what could be easier? The task would be simply to gather six to eight riders and horses and tie them together with an existing cannon, complete with limber. It sounded simple. Little did anyone envision the formidable task ahead.

In August 1974, a small group of people sat down to outline the obvious needs of the project. (This group was to become the nucleus of the 147th Field Artillery Historical Society.) It was determined that harness, saddles and some type of uniform were needed. Some money was also required but no one felt it would be much. With responsibilities assigned, members went to work completing research on equipment needs and availability. Plans were made for raising money. Optimism still reigned supreme

but reality was soon to be encountered.

The first brush with reality came when it was discovered that the harness with breast collar used by the Fort Sill Half Section was not adopted by the Army until some time after the turn of the 20th century. With the assistance of Mr. Gillett Griswold, director of the Field Artillery and Fort Sill Museum, plans and specifications for the proper harness were obtained. It was manufactured locally. Saddles came from the South Dakota State Museum and private owners and through the purchase of replicas.

By this time the group realized that fairly large sums of money would be needed. However, by enlisting the support of the entire South Dakota Army National Guard and through a grant from the State Bicentennial Commission, adequate funds were available.

Obtaining uniforms proved to be one of the most difficult problems since all the replica dealers contacted were committed to other orders for the bicentennial. Additionally, no records were found to show what uniform, if any, was worn by the Clark Battery. Research did indicate, though, that State and National Guard units were still wearing cast-off Civil War uniforms as late as the turn of the century. With this in mind, a uniform of blue trousers, artillery shell jacket, artillery boots, spurs and forage cap was devised. All uniform items were readily available through replica dealers except the shell jacket. One replica firm did supply authentic fabric, braid, buttons and patterns for the jacket and two unit wives volunteered to make them.

By the summer of 1975, most of the equipment needs had been met and the time had come for a serious look into the problem of locomotion for the gun. Purchase of horses out of existing funds was not possible since the cost was estimated to be \$6,000. Fortunately, two of the full-time National Guard technicians, horsemen MSG Robert Hagemann and SFC Dennis Lyngstad, became the mainstay of the horse procurement effort. Master Sergeant Hagemann gave the project an immediate impetus by offering the services of two registered quarter horses. SP4 Ronald Volmer, another member of the unit, provided two additional horses. Initially, the plan had called for a six-horse

**Personnel of the 147th Field Artillery Half Section prepare for action during their initial performance at Redfield, South Dakota, October 1975.**

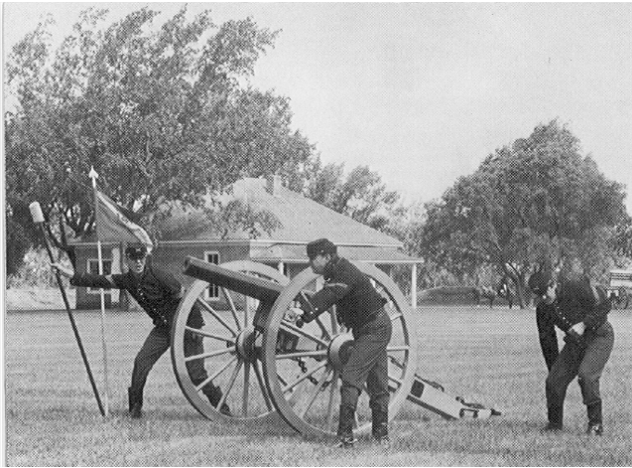


**Horse transporter of the 147th Field Artillery Half Section. Artwork done by SGT Merlin Shuh, 665th Ordnance Company (HEM), SDARNG, Mitchell, South Dakota. Front six feet of the semitrailer serves as tack room for half section equipment.**

hitch; however, research indicated that the Clark Battery had operated with only four horses per weapon during the late 1800s. In addition to the teams for the gun, mounts were provided for out-riders — a chief of section, a guidon bearer and a bugler.

Since none of the horses had been broken to harness, initial harness training was accomplished one team at a time using normal draft harness and small two-wheeled racing "chariots." When both teams were accustomed to pulling together, the change was made to the artillery harness and hitch with the two teams hitched in tandem. The only difficulty during the harness training was for the teams to become accustomed to the additional weight of the cannon when they were hitched to the gun and limber.

Since all of the horses had at some time appeared in parades, it was anticipated that little difficulty would be encountered working the horses around crowds. Therefore, the primary problem was to accustom the animals to cannon firing. The unit obtained 100 pounds of black cannon powder and authentic friction primers. The men trained in cannoneer duties based on Patten's *Manual of Artillery Drill* of 1861. They were prepared to test their skills as muzzle-loading cannoneers and to observe the reactions of the horses to the cannon firing. On the big day of firing someone fortunately had the foresight to suggest completely unhitching the horses from the limber and leading them off some distance from the gun to observe the firing. With much ado, a prepackaged charge of approximately one pound of black powder was carefully loaded and rammed, the vent hole cleared with the vent pick and the primer inserted — all was ready for firing. Everyone stood aside and watched breathlessly while the lanyard was attached to the primer. That was the last quiet



**Misfire! A sometimes occurrence at Fort Sisseton.**

moment of the day! As the lanyard was pulled, a resounding "boom" echoed through the area, a large sheet of flame and a cloud of black smoke erupted from the tube . . . and four horses departed the area dragging resisting horse holders in their wake. The remainder of the afternoon was devoted to rounding up horses from the countryside.

By October 1975 the half section was (in theory) ready for its first public appearance. The section joined the South Dakota Bicentennial Wagon Train at Redfield, SD, and performed a firing demonstration for the Redfield fairgrounds crowd. That performance must have been somewhat less than spectacular. The section entered the arena at a gentle trot, unlimbered the gun, carefully removed all the horses from the arena (hiding them behind some nearby buildings) and, after three attempts, managed to fire the cannon. The entire appearance left considerable room for improvement, but at least the project was now officially launched.


The trip to Redfield uncovered two new problem areas, either of which could mean the death of the project. First, a better system for transporting the gun and horses during travels around the state was needed. Second, it was very apparent that the wheels on the 1863 cannon would not survive the bicentennial year without major repair.

A partial solution to the transportation problem came during the summer of 1975 when a boat trailer was located. With modification, it made an excellent transporter for the gun and limber. The men had been using two horse trailers belonging to members of the half section to haul the horses; however, this required three pickup trucks to haul the gun and all the horses. Availability of all the pickups and horse trailers on any given day was questionable. Two enterprising gentlemen of the State maintenance facility solved this problem. They not only obtained a semitrailer with tractor on a loan basis but also, with the artistic talents of SGT Merlin Shuh, completely renovated the trailer. It was painted red, white and blue and decorated with murals of the half section.

The deteriorating cannon wheels became the greatest challenge to date. Over the years, the wood in the wheels had dried and rotted. Sizeable chunks of wood began to flake off whenever the gun was moved. Attempts to locate a wheelwright were futile and, although firms could manufacture new wheels, the cost was prohibitive. Finally, the section initiated an all-out search for the second Clark Battery cannon, hoping to find useable wheels. After tracing many false leads, that gun was found in Watertown, SD. The ravages of time and weather had rendered its wheels in even worse condition than the ones being used. The project seemed doomed until someone came up with the perfect solution — fiberglass. Several coats of excess paint and all the rotted wood were removed by sandblasting the wheels. After sandblasting, there were gaps between the metal rim and the wood and, for a nominal charge, these were filled with fiberglass by a commercial firm. So far, the fiberglassed wheels have been able to withstand every bump and jolt.

In June 1976, the 147th was scheduled to attend annual training at Camp Ripley, MN. It would have been interesting to have been present at Camp Ripley headquarters when, with the normal support requests, a request was received from the 147th FA Group for space to pasture eight horses. Although the request probably caused considerable stir, the reply simply stated that space was being made available for the horses near the post ammunition dump where a large stand of bluegrass was available for pasture. The off-duty hours during annual training provided an ideal time to conduct half section practice sessions.

With extensive off-duty training at Camp Ripley, the half section began to take shape and, when it performed for the Governor of South Dakota, there was little resemblance to the unit seen at Redfield the previous fall. The approach into the demonstration area was made in what could best be described as a controlled runaway. The weapon was unlimbered, horses and limber removed approximately 30 meters from the gun and the chief of section gave the command to fire while mounted on his horse to the immediate rear of the weapon. The half section had finally accomplished what had been envisioned some 20 months before.

During the summer months of 1976, the 147th Field Artillery Half Section traveled more than 3,000 miles throughout South Dakota to present 30 performances to some 150,000 people. These demonstrations occupied nine weekends during a 14-week period. All this was done with little or no recompense for the time and effort devoted to the project. This is indicative of the pride and professionalism not only of the 147th Field Artillery Group, but also of the South Dakota National Guard! 

**LTC Clare D. Bedsaul, FA, is Unit Advisor, 147th Field Artillery Group, South Dakota Army National Guard.**

## Chapter Six



# Winning The West

by COL (Ret) Robert M. Stegmaier

Sam Houston once remarked that a Texas Republic stretching from Texas to and including California would become a reality. That was accomplished by the United States in 1846.

### War With Mexico

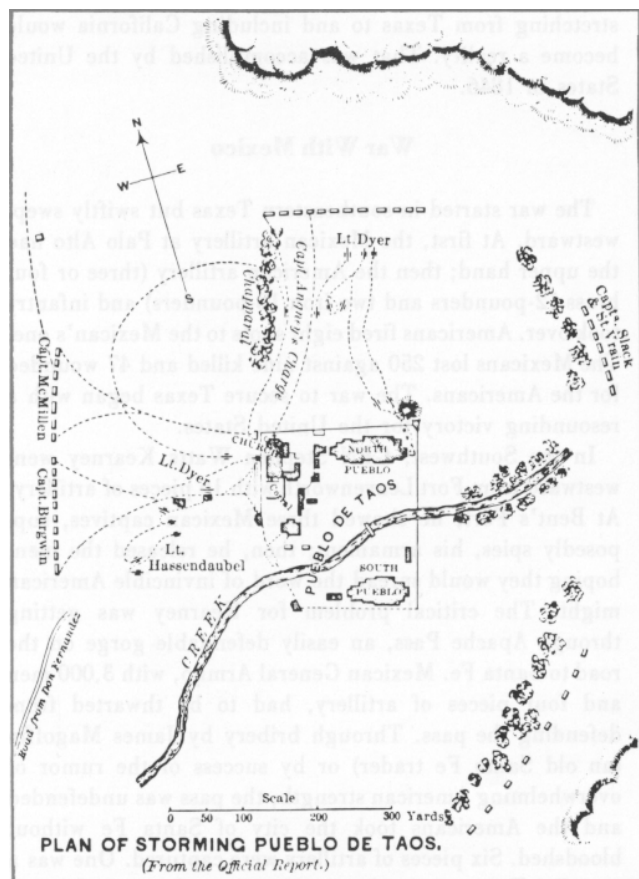
The war started in southeastern Texas but swiftly swept westward. At first, the Mexican artillery at Palo Alto had the upper hand; then the American artillery (three or four brass 12-pounders and two iron 18-pounders) and infantry took over. Americans fired eight shots to the Mexican's one. The Mexicans lost 250 against nine killed and 47 wounded for the Americans. The war to secure Texas began with a resounding victory for the United States.

In the Southwest, GEN Stephen Watts Kearney went westward from Fort Leavenworth with 16 pieces of artillery. At Bent's Fort, he showed three Mexican captives, supposedly spies, his armament; then, he released the men, hoping they would spread the word of invincible American might. The critical problem for Kearney was getting through Apache Pass, an easily defendable gorge on the road to Santa Fe. Mexican General Armijo, with 3,000 men and four pieces of artillery, had to be thwarted from defending the pass. Through bribery by James Magoffin (an old Santa Fe trader) or by success of the rumor of overwhelming American strength, the pass was undefended and the Americans took the city of Santa Fe without bloodshed. Six pieces of artillery were captured. One was a very fine Texas piece taken in 1841 from General McLead. The gun was inscribed with the name of General Lamar, then President of the Texas Republic.

The first formal battle with the Mexicans in New Mexico occurred at Brazitos on Christmas Day 1846. There, Gen. Ponce de Leon, with 514 Mexican regular dragoons, 800 infantry and four pieces of artillery, attacked American Colonel Doniphan's 500 Missourians who had no artillery. The dragoons charged and were cut down by the sharp-shooting frontiersmen. When the Mexican infantry charged, the Missourians lay flat on the ground and the enemy shots passed harmlessly overhead. The ensuing retaliatory fire destroyed the infantry advance. Mexican artillery was of little effect because the weapons fired single shot which could be seen in flight and could be avoided. The Missourians captured one 6-pounder but, before it could be used, the enemy had disappeared. The foe lost 43 killed and 150 wounded against seven wounded for the Americans.

Doniphan waited in El Paso for six guns before starting for Chihuahua. In the subsequent battle for Chihuahua, coordination among the combat arms was at its ultimate. Defeat there for the Americans would have meant a panicky retreat, with constant pursuit by vengeful Mexicans. With water a scarce item, Doniphan's army would probably have

### Sketch map of Pueblo De Taos.



been annihilated. So sure of victory were the city inhabitants, they hastened to nearby hills for sideline seats. There were 4,220 Mexicans with 16 pieces of artillery behind strong fortifications against 1,164 Missourians and six pieces. Delaware Indians, recently in Chihuahua, informed Colonel Doniphan that the defenses and artillery were strongest facing the northbound road and weakest facing west. Doniphan acted on this advice. The battle opened with an attack by 1,200 mounted Mexican lancers. A 50-minute artillery duel ensued; the Missourians in most cases were able to see the single shots coming and dodged them. Finally, the Americans charged; the infantry and mounted dragoons, closely supported by artillery fire, swept up and over the ramparts. Captured were 10 cannons of different calibers, varying from 4- to 9-pounders, and six culverins. The American loss was four killed and eight wounded; the Mexican loss was 304 killed and 500 wounded. Victory and virtual assurance against Mexican invasion of the Southwest had been won against frightening odds by teamwork of the three combat arms plus assistance from friendly Delaware Indians.

Back in New Mexico, the Pueblo Indians revolted in Taos and killed the American governor, Charles Bent. Colonel Price, with 497 men and five artillery pieces, hastened to

squash the rebellion. At Taos, the strongpoint was a thick-walled adobe church. American artillery fired unsuccessfully for two hours. Infantry attacked and found refuge against the wall. Men led by Captain Burgwin attempted to break down the church's front door, but this brought them under direct Indian fire and Captain Burgwin was killed. Infantrymen with axes began to chop away at the adobe. Artillery was run up within 60 yards of the wall. A breach was made in the wall, and the guns, which were moved forward to 10 yards, poured grapeshot into the building. Many Indians fled to the hills, but mounted frontiersmen, led by Captain St. Vrain, ran down those escaping. Again, coordination of the combat arms brought victory.

As General Kearney preceded his artillery on his journey to California through Arizona, he was forced into battle with California lancers and lost 22 men before his artillery arrived. When the howitzers arrived, they offered protection to the survivors until aid was summoned from San Diego by Kit Carson (later brigadier general) and Ensign Beale. Artillery fire was a new and unpleasant experience to lancers who had been riding and spearing their opponents almost at will.

At the San Gabriel River near Los Angeles, General Kearney, with 500 men and a battery of four guns, met the Californians, 600 strong and reinforced with six pieces of artillery. Commander Stockton reported: ". . . a complete victory over the insurgent army. The next day . . . the insurgents made another desperate effort to save their capitol and their own necks . . . . We soon silenced their guns and repelled the charge when they fled . . . ." The Californians lost between 70 and 80 while the Americans suffered 20 killed and wounded. California was won for the Americans.

### Civil War In The Southwest

With the beginning of the Civil War, the Confederates were more ready than the Federals to take over New Mexico and Arizona. COL John R. Baylor in western Texas had organized a rebel regiment earlier to combat Indians. The area was ready for infiltration by strength. Utah, guarded by the 4th Artillery, was a question mark. In Colorado, Governor Gilpin reported 7,500 secessionists ready to capture Fort Wise (Bent's Old Fort) and Fort Garland, to surround New Mexico and invade it from the north. Regular Union officers joining the Confederates were LT Joseph Wheeler, CPT Richard S. Ewell, LTC George B. Crittenden, CPT Carter L. Stevenson, MAJ Henry Hopkins Sibley, MAJ James Longstreet, CPT Cadmus M. Wilcox and COL William M. Loring — all became generals. GEN Albert Sidney Johnston passed through New Mexico from the Department of the Pacific on his way to Richmond. Fortunately, only one Union soldier defected to the Confederates.



**Kit Carson.**

All Indians north of the Red River were considered loyal to the Confederates. Also, the native population of New Mexico and Arizona were thought to favor the Southern cause. Southern California, due to cattle trade with Texas, was figured to fall easily if Confederate forces showed up.

In 1861, Arizona declared itself for the Confederacy. By May, all Union troops in Arizona were ordered to withdraw. Forts in New Mexico were evacuated, except for Fillmore, Graig and Union. Confederate Colonel Baylor advanced to, and captured, El Paso.

Of Fort Fillmore, the closest to El Paso, MAJ Isaac Lynde wrote departmental headquarters on 7 July 1861: "This fort is very badly situated for defense. It is placed in a basin, surrounded by sand hills, at least half the circumference of the circle, and they are covered by a dense growth of chaparral. These sand hills completely command the post and render it indefensible against a force supplied with artillery. A force of a thousand men could approach it, within 500 yards, under perfect cover."

Out in California on 25 May 1861, Union Major Carleton with 50 men of Company K, 1st Dragoons, paraded in Los Angeles. Two brass cannon fired a salute to the United States. Southern California remained loyal to the Union.

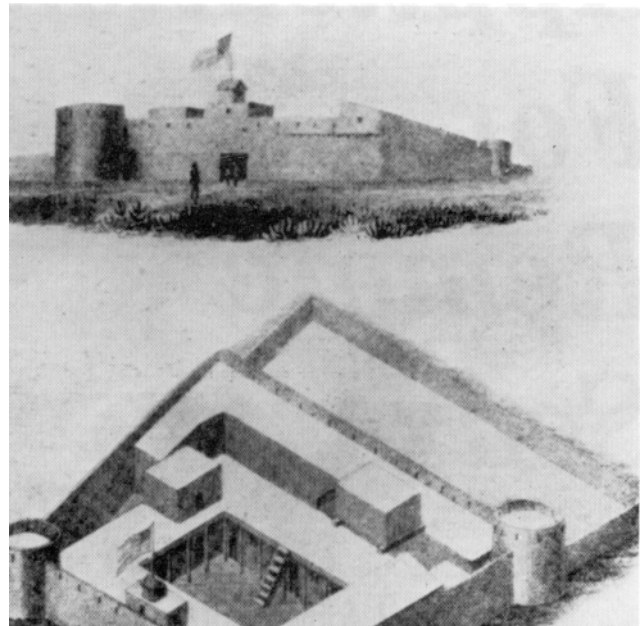
A little later, Colonel Carleton, now commanding the California column, received orders to proceed East to New Mexico. Methodically, he set up depot supplies en route. Other than possible Indian attack, he expected no opposition. At Picacho Pass, advance guards fought the only battle in Arizona. When word reached Tucson of the approaching Californians, Captain Hunter evacuated the city. An artillery salute welcomed Carleton to Tucson. While retreating to New Mexico, Hunter was attacked by Apaches, but a round of howitzer fire dispersed the attackers.

At Apache Pass in Arizona, Captain Roberts of the California column, with approximately 140 men and two mountain howitzers, met the Apaches. A sudden hail of shot and arrow was unexpected. The soldiers retired but their thirst allowed no reasonable alternative except to capture the Pass spring, the only water for 40 miles. Two howitzers were rushed to the front. It was now the Apaches' turn to be surprised. Accustomed to the stright line shooting of the Spanish, they considered themselves safe behind boulders. When the howitzers fired, there was a second "bang" over the heads of the hidden Indians. The soldiers were using time fuses and airbursts. The Apaches broke. The California Legion then marched unimpeded through Apache Pass into Arizona and then New Mexico. With Carleton's California units in New Mexico, the Confederates made no further strong attempt to win the Southwest.

Thereafter, Indians were the problem — Utes, Navajoes, Apaches, Comanches and Kiowas. Artillery was of little use in the hit-and-run warfare used by these tribes. In 1864, BG Kit Carson, with 445 men and a section of artillery, narrowly escaped annihilation. Near Adobe Walls in Texas, after overrunning one Kiowa village, Carson's army suddenly was faced with 1,000 to 1,500 aroused warriors. Retreat was ordered with Lieutenant Pettis' artillery keeping the mounted enemy at a distance. Carson's troops escaped. Later one Kiowa chief stated that if it had not been for the wagons [howitzers] that shoot twice they would have wiped out the entire column.

Chivington's Coloradoans, Doniphan's Missourians and Carleton's California column, plus artillery and the loyalty of the majority of the Southwest people, kept the Southwest within Federal ranks. ❏

#### **Fort Wise (Bent's Old Fort).**





# *Field Artillery Applications For Remote Sensors*

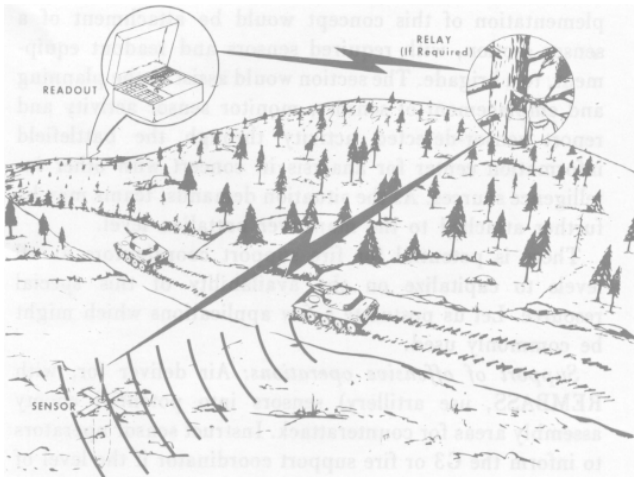
by COL Louis C. Friedersdorff and  
MAJ John P. Bulger

Commanders have a new resource at their disposal, one which has a proven capability to save lives and increase the effectiveness of fire support — remotely monitored sensors.

Sensors were developed during the Vietnam era as a means of detecting infiltration of men and materiel into South Vietnam. In concept, the devices are simple (see figure 1). The passage of men on foot or vehicles produces various disturbances which may be in the form of changes to the seismic, acoustic, magnetic, electromagnetic or infrared environment. Remotely monitored sensors are designed to detect these disturbances and report these detections by data link to a distant monitoring site. Sensors used in the Vietnam anti-infiltration role were emplaced by hand or delivered from aircraft along known or suspected infiltration routes. Sensor data normally were relayed to a central analysis facility — the infiltration surveillance center — and processed and analyzed in conjunction with other intelligence sources. A capability also existed to permit immediate operational response to sensor-detected infiltrations.

A second sensor application in Vietnam was in support of the barrier system south of the Demilitarized Zone. Many of the sensor resources originally designated for use in the barrier role were diverted to support the defense of Khe Sanh during the spring of 1968. The effectiveness of that application is best described by COL David E. Lownds, then commander of the 26th Marines, who conducted the defense. In a statement to the Preparedness Investigating Subcommittee of the Senate Armed Services Committee in November 1970, Colonel Lownds said: "(One development) which played a significant role in the defense of Khe Sanh was the sensor . . . . It allows a commander to quickly locate enemy assembly areas and destroy or render ineffective the main force before he can close the main battle position. In this regard, one particular situation at Khe Sanh comes to mind. It occurred in early March 1968. The sensors, which had been emplaced along Route 9 to the Laotian border, suddenly came to life and it became obvious that a large column was moving adjacent to Route 9 toward the base. A previous personal reconnaissance prior to the start of the battle gave me the time it took to reach given points along the road and the sensors were verifying the information that the NVA were proceeding as estimated. By computing the length of the column by information produced by the sensors, it became obvious to me that an enemy regiment was trying to close the base. This information, coupled with possible assembly areas, allowed us to bring down upon this unit devastating firepower (i.e., B-52, tactical air and artillery) to break up the impending attack. Approximately only one company was able to close and they were destroyed in front of the ARVN positions on the southeast corner of the perimeter. Circumstances such as this occurred several times (although the enemy forces were not necessarily in regiment size) during the battle of Khe Sanh."





**Figure 1. Remotely monitored sensor concept.**

Sensor applications such as these led to a change in the sensor development program. Specific developments were undertaken to provide sensors for employment by ground forces. As these resources became available to ground commanders, some startling results were achieved. Examples of particular interest to the artilleryman are quoted from MG Ellis W. Williamson's statements to the same subcommittee. At the time of these examples, General Williamson commanded the 25th "Tropic Lightning" Division.

In describing one of the division's applications of sensors, General Williamson provided this example from a fire base near the Michelin rubber plantation: "Early one morning before daylight our unmanned sensors alerted the monitor and he, in turn, alerted the command group and the fire support elements. After a short while, it was determined that an enemy force was in a bamboo thicket several hundred yards from our position. Our artillery guns and mortars were laid and, on signal, all opened fire at once; we ceased fire and waited. Absolutely nothing moved, and we feared that maybe we had reacted to a false alarm.

"At daylight a patrol was sent out to investigate the area. They found 21 enemy dead and picked up four wounded prisoners. They also found 129 rounds of heavy weapons ammunition, three rocket-propelled grenade launchers, a complete mortar and a flame-thrower."

In a second example, General Williamson describes the effort to monitor activity on a particular road junction. "In the third week of September (1968) our efforts with sensors finally paid off. At 11 o'clock one night, the monitor at French Fort indicated movement being reported by two of our sensors. It was raining rather hard, but there was no doubt about the reading — something more than rain was registering on the Portatale monitor.

"Two of the 175-mm guns opened up slightly north of the sensors while two 81-mm mortars fired directly on the

road junction. At first light the following morning, reconnaissance helicopters reported to our patrol, headed for the area, that enemy bodies were observed from the air. When the patrol arrived on the scene, they found literally a carnage. The big 175-mm guns had found their target. Enemy field equipment and weapons were strewn about the rice paddy.

"We found just seven bodies, but we also found an additional 30 drag trails and blood trails leaving the area. Documents identified the enemy's 271st Regiment, a part of the 9th Division.

"Our intelligence officers believed that an attack on our fire base Buell may have been preempted."

Successes such as these have led to development of the Remotely Monitored Battlefield Sensor System (REMBASS) and other ground sensor systems. REMBASS will be an all weather, day/night sensor system capable of worldwide operation. REMBASS sensors will be capable of detecting and distinguishing between personnel and wheeled and tracked vehicles. The sensors may be emplaced by hand, air or artillery and can report data to the monitoring station over extended distances or terrain barriers by the use of ground and airborne relays. Ultimately, REMBASS may include imaging sensors, akin to remote TV cameras, and be capable of processing large volumes of sensor information with data processing equipment. It is envisioned that REMBASS will be the general remote ground sensor system for all the services.

### PEWS and FAALS

Two other sensor developments of interest to the artilleryman are PEWS, the Platoon Early Warning System, and FAALS, the Field Artillery Acoustic Locating System. PEWS is a lightweight, self-contained sensor system designed for employment at the small unit level. Each PEWS set consists of nine sensors and a receiver/monitor capable of monitoring each sensor by wire or radio to a range of 1,500 meters. The system is scheduled for

**The DT 567, an air-delivered seismic classifier, will be capable of delivery from very low flying Army aircraft as well as high performance aircraft.**



production in 1978 and could be particularly useful to the artilleryman for perimeter defense.

FAALS employs a new concept for sound ranging [FA Journal, March-April 1974]. Acoustic sensors, designed to detect artillery muzzle blasts and shell bursts, are employed well forward of the forward edge of the battle area (FEBA). These sensors, delivered by artillery or aircraft or buried by hand, detect muzzle blast and shell bursts and transmit information concerning those events via a radio link to the FAALS Target Processing Center (TPC). Upon receipt of these messages, the TPC "time tags" the data, sorts the data into related sets and computes the location of the blast sources. The resulting information is displayed to an operator. If appropriate, the FAALS operator can command the system to forward results to the TACFIRE system for counterbattery engagement or other applications.

The FAALS system will be capable of several functions. These include:

- Accurate location of hostile artillery pieces.
- Sound-on-sound registration of friendly artillery.
- Self-survey of sensors located forward of the FEBA.
- Automatic update of meteorological data affecting FAALS results.

An advanced development prototype of FAALS will be built and tested in the near future.

REMBASS is scheduled for production and deployment in the early 1980s. In the interim, the Southeast Asia Operational Sensor System (SEAOPSS) has been adopted for limited issue and deployment by US forces. This sensor system, developed for use in Vietnam, is now in use in all Marine divisions and four Army divisions (the 82d Airborne, 101st Air Mobile, 2d Armored and 25th Infantry). The Navy and Air Force have also maintained a capability to employ sensors.

### Sensor Platoons

Within the Army, the remote sensor platoon provides the expertise to employ sensors and interpret the results. Sensor platoons are organized and equipped to provide sensor support down to battalion level. Although this support is now limited to the four divisions equipped with SEAOPSS sensors, this capability will be expanded when REMBASS is fielded. The platoon can configure arrays and strings of sensors designed to monitor a variety of enemy activity. Some typical applications are:

- Monitor suspected or potential assembly areas or hostile artillery positions.
- Detect movement along and through defiles or other areas where direct observation is difficult or impossible.
- Monitor and track traffic moving along roads and through key intersections.

### Employment

The normal concept of employment calls for centralized control of sensor resources at division level, with

decentralized execution down to battalion level. One implementation of this concept would be attachment of a sensor section, with required sensors and readout equipment, to a brigade. The section would assist in the planning and emplacement of sensors, monitor sensor activity and report sensor-detected activity through the battlefield information center for analysis in concert with other intelligence sources. As the situation demands, teams may be further attached to the maneuver battalion level.


There is potential for fire support coordinators at all levels to capitalize on the availability of this special resource. Let us postulate a few applications which might be commonly used:

*Support of offensive operations:* Air deliver (or, with REMBASS, use artillery) sensors into potential enemy assembly areas for counterattack. Instruct sensor operators to inform the G3 or fire support coordinator if the level of activity noted in those areas increases. Insure that concentrations are planned on those areas.

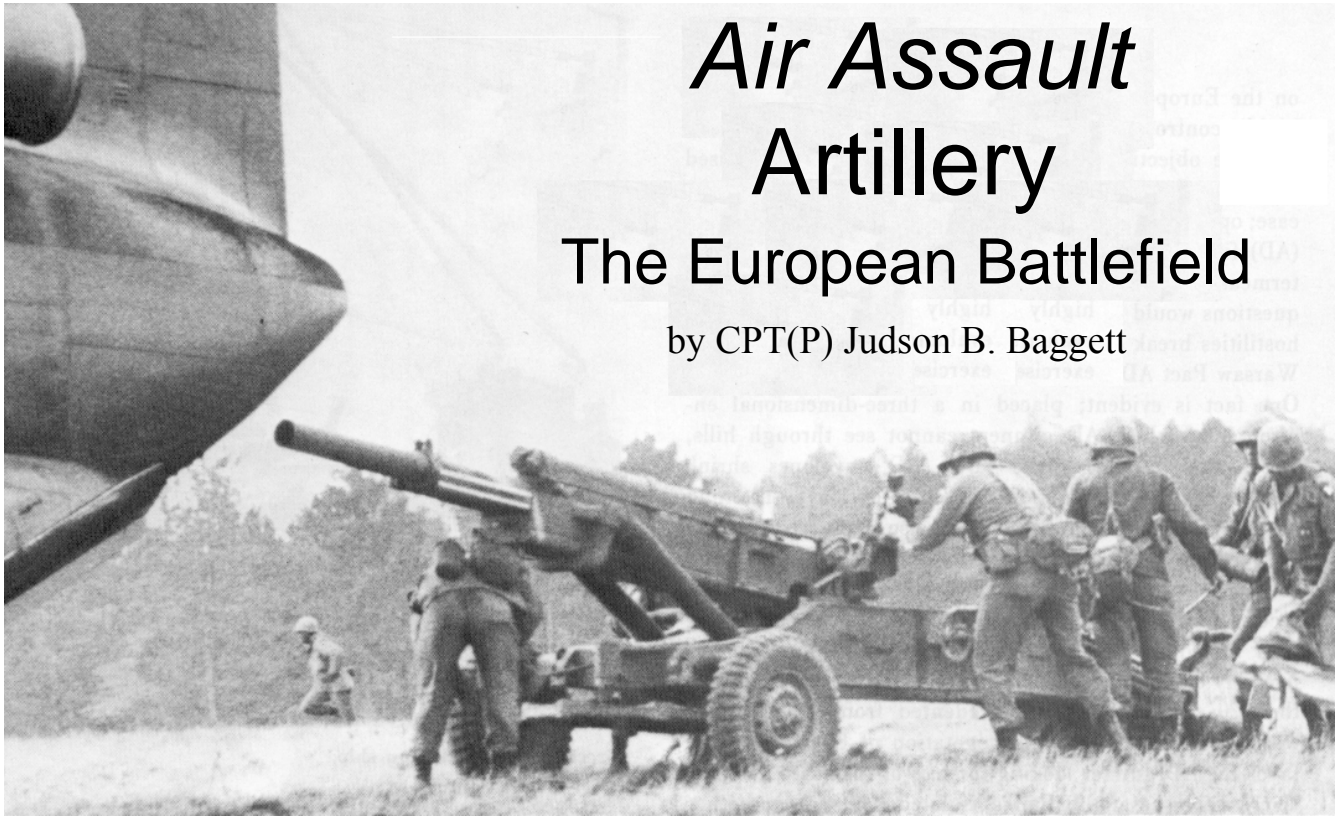
*Support of defensive operations:* Cover defiles or other difficult to observe areas with sensors. Respond to detected activity with preplanned concentrations.

*Harrassing and interdiction (H&I) fires:* Conserve ammunition by limiting the use of H&I fires to those fire plans based on sensor-observed activity. Fire on road junctions, suspected command post locations or suspected assembly areas only if sensors indicate there is significant activity in the area.

These applications will necessitate planning between the fire support coordination staff and the remote sensor platoon. Remember, sensor-derived information is normally fed into the intelligence system at the battlefield information center for analysis in conjunction with other intelligence sources. The applications proposed here constitute direct reaction to sensor-derived information. The fire support coordinator must therefore participate in planning for emplacement of sensors. Sensor operators must be alerted to make specific response to sensor detections of interest to the fire support coordinator, and a quick fire channel must be established to permit timely response. Lastly, subsequent sensor-derived data must be analyzed for battle damage assessment.

Will it work? Will it be effective? Do the benefits gained from applying those concepts justify the burdens and risks associated with the planning for and employment of the sensors and establishing the channels for quick response? We think so. The concepts are not new. They are identical to those used successfully in Vietnam by innovative commanders. Through continued application in a modern day environment, exercise of the planning, execution and information flow channels and required modification of techniques, the concepts can still get remarkable results. Perhaps more important, they will be kept alive and efficient for application when Army sensor resources are expanded with deployment of REMBASS and FAALS. 

**COL Louis C. Friedersdorff, FA, is Project Manager of the Remotely Monitored Battlefield Sensor System (REMBASS), Fort Monmouth, NJ; and, MAJ John P. Bulger, FA, is assigned to the REMBASS Project Manager's office.**



# *Air Assault Artillery*

## The European Battlefield

by CPT(P) Judson B. Baggett

REFORGER 76 offered a unique opportunity for the 101st Airborne Division (Air Assault) Artillery to try out its wings and to demonstrate clearly the strength and flexibility of air assault artillery. The 101st Division deployed with a force of 11,000 personnel and organic equipment, by land, sea and air from CONUS to Central Europe; div arty deployed with two of its three direct support (DS) battalions taking 701 personnel. Each battalion deployed in task force configuration with its normally supported brigade. The division's equipment was transported by rail to Norfolk and then in three roll-on, roll-off ships and one break-bulk freighter to Europe. A total of 348 of the division's 422 organic aircraft were flown to the port, prepared for shipment, and then loaded on the ships. Personnel were deployed on 125 C-141 aircraft from Campbell Army Airfield to Rhein Main and Ramstein Air Force Bases. REFORGER 76 included strategic deployment, tactical employment and operations with both US corps in Europe and a strategic redeployment to CONUS: two major FTXs were conducted, Exercise GORDIAN SHIELD (V US Corps) 4-11 September and Exercise LARES TEAM (VII US Corps) 12-17 September. The exercises encompassed 15 days in the field and consisted of operations over extended frontages in northern and central Germany, ranging from Nuernberg to Fulda.

### **A Word On The Air Assault Division**

Contrary to what some believe, 101st Airborne Division tactics are not limited to camouflage painted troopers rappelling from helicopters 75 kilometers beyond the

frontlines with trench knives clenched in their teeth. Behind-the-lines operations are a definite capability, but are the exception rather than the rule. With its three air assault brigades and the largest aviation group in the Army, the 101st is capable of fighting a conventional war almost anywhere and against any opponent — including armor. With a total of 168 mule-mounted TOW missiles backed up by 87 TOW Cobras, the 101st has an antiarmor capability that will guarantee enemy tankers a thrill-a-minute.

Perhaps somewhat oversimplified, the 101st is capable of moving large or small combat forces rapidly throughout the battle area, giving the corps commander tremendous flexibility. Evident from REFORGER 76, air assault forces teamed with mechanized and armor elements to provide a potent, flexible force capable of conducting effective combat operations against a numerically superior enemy armor force. The ability of an air assault force to shift elements laterally across broad frontages rapidly enables it to concentrate a preponderance of combat power at the point of decision; any organic fire support for such a division must have the same capability and mobility. REFORGER gave the 101st Div Arty its first demanding test of exercising the mobility required under fast moving European conditions.

### **Survivability**

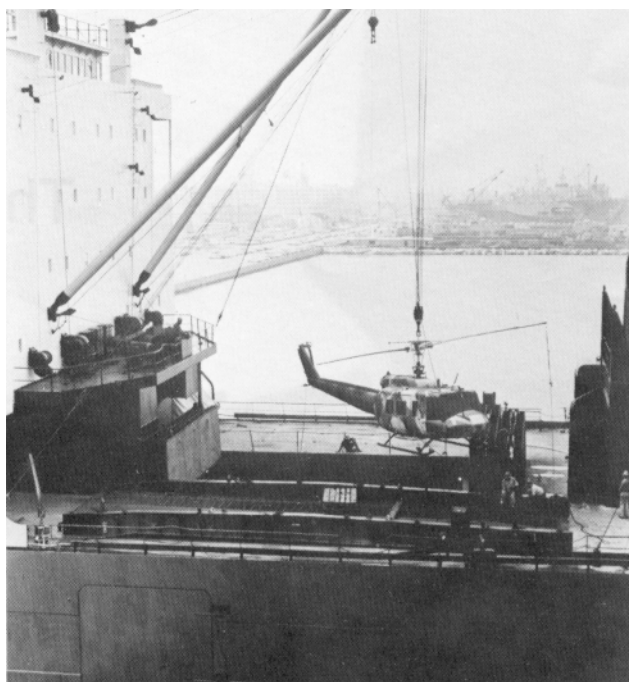
There are misconceptions concerning the survivability of the helicopter and the effectiveness of air assault operations

on the European battlefield. Helicopter survivability is a highly controversial subject and, at best, is difficult to evaluate objectively even in the most closely supervised exercises. Some advocates of the helicopter overstate its case; opponents tend to see a wall of interlocking air defense (AD) fires that precludes *any* flying, regardless of countermeasures or techniques. While many survivability questions would undoubtedly be answered in detail should hostilities break out, in-depth studies have been made of Warsaw Pact AD arrays under varying terrain conditions. One fact is evident; placed in a three-dimensional environment, where AD gunners cannot see through hills, trees, and buildings, the large AD envelopes shrink drastically from those shown on map overlays. Training and Doctrine Command tests have also demonstrated that properly equipped helicopters operating at ranges in excess of 2,500 meters, exposing themselves for less than 20 seconds, have a better than 99 percent chance of surviving in a mixed AD environment. The TOW Cobra can effectively engage targets at a range of 3,750 meters in less than 20 seconds. The unprecedented frontages, coupled with the varied terrain and vegetation of Europe, do not favor the AD gunner looking for nap-of-the-earth aircraft. There will be assailable flanks, isolated elements, and other ample opportunities to move forces and weapons to critical areas. From the 101st point of view, capabilities of the helicopter must be exploited; this includes its complete integration into the combined arms team.

Air assault artillery survivability in the European environment is directly related to helicopter survivability, particularly when the artillery leaves its prime movers behind. Active and passive defensive measures have been learned and refined since the return of the 101st from Vietnam. The 101st Div Arty no longer slings its howitzers externally, but moves them internally in the CH-47, eliminating the signature of the slung howitzer and ammo, and increasing aircraft speed. Survivability of the artillery after arrival in the landing zone (LZ) is another interesting aspect in the highly mobile mechanized and armor environment. More to come on this . . . .

### **Air Assault Mobility Versus Ground Mobility**

One important lesson learned during REFORGER 76 is that the air assault artillery could not survive without its newly acquired prime movers (gama goats). Prior to "quick fix," the 101st Div Arty was the only artillery unit in the Army without prime movers. The CH-47 was considered the designated prime mover even though the aircraft were not dedicated to the artillery. The need for organic prime movers was immediately apparent when the division entered the V Corps exercise and the artillery found itself routinely facing the enemy coming over the hill. In these situations, firing batteries would have been quickly



**Aircraft being loaded on ship.**

destroyed or overrun without the ability to displace on very short notice (10 minutes or less) using their own resources. During REFORGER, *all* batteries would have been overrun without the self-movement capability.

So why have the air assault capability? Here's where the 101st artillerymen really earn their pay — moving long distances or over obstacles that would not be feasible with towed or self-propelled artillery. The artillery air assault move requires time, patience, skill, and a lot of sweat and muscle. The guns are rolled out of the back of a CH-47; then each gun must be manhandled into the treeline or carefully camouflaged in place. The point: Air assault artillery *can* move rapidly over extended distances, *can* resupply itself in combat, and *does* provide the critical fire support needed by air assault maneuver forces. Towed or self-propelled artillery cannot fulfill the requirements for supporting the air assault force on long-range operations.

There are several questions that must be answered when preparing for an air assault move and some of these were underscored by REFORGER 76 experiences. Is the LZ secure? How long will it remain secure? During REFORGER, on more than one occasion, a battery found itself engaged in close-in fighting as the advance party left the aircraft; others spotted armored columns within minutes of their intended LZs and had to move to an alternate LZ. Since the battery commander is faced with immobility on the ground (until the aircraft can return for extraction or until his prime movers are brought forward), LZ security is critical on the European battlefield where fast-moving armored forces may be able to react almost immediately.

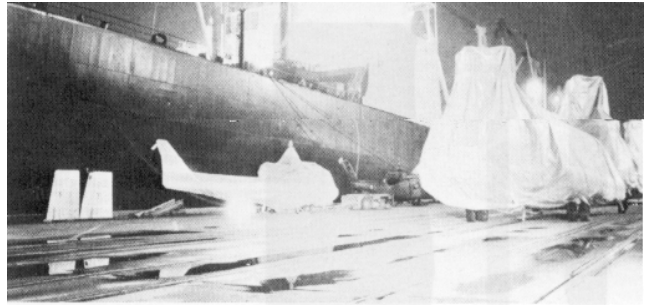
## The Air Assault Artillery Raid

The artillery raid, while not new (*FA Journal, May-June 1976*) is a capability continually being refined by the 101st Div Arty and one which cannot be overlooked when discussing air assault employment in Europe. A normal air assault artillery raid consists of four howitzers rapidly inserted well behind enemy lines, which fire 40 to 60 rounds on predetermined targets. With internally loaded howitzers, the CH-47s fly nap-of-the-earth over carefully planned routes and at high speeds to avoid detection. The guns are extracted by CH-47s that have remained at or near the firing position and then the howitzers are moved to another raid position or returned to the former battery position. Normal ground time (from first aircraft touchdown until last aircraft liftoff) within 101st Div Arty is eight to nine minutes during daylight and 11 to 12 minutes at night. These times include "safety time" and would be decreased in combat. The "cross-FEBA" raid concept proved valid during REFORGER, providing deep fires on targets located where air defense prevents attack by aircraft. The 101st Div Arty conducted a successful four-gun raid against a division logistics complex and no casualties resulted. There is obviously a considerable risk involved in sending men, equipment, and aircraft over the FEBA to conduct artillery raids, and hard intelligence is a must to justify the risk. Where warranted, suppressive fires and electronic countermeasures are used to reduce risks.

## The M102 In Europe

Some in the Artillery Community still question the use of the 105-mm howitzer as an effective fire support weapon. Larger calibers are available throughout the Army and advocates of medium artillery continue to argue against the effectiveness of the smaller 105-mm round. REFORGER 76 established the need for the light, rugged M102 howitzer to provide the close supporting fires for air assault troops. This weapon offers several advantages over medium artillery in the air assault role, primarily in the area of mobility. Some examples: In terms of tactical mobility, it takes nine CH-47s to move a M102 battery (less prime movers) with its basic load; it takes 16 sorties to move a 155-mm battery; and, it takes four sorties to resupply 105-mm ammunition to the battery with a controlled supply rate (CSR) of 150, while six sorties are required to move 155-mm ammunition with a CSR of 100. The M102 can be displaced 212 nautical miles by the CH-47 "Super C"; the 155-mm, only 170. Weapon lethality favors the 155-mm against hard targets, but against soft targets (personnel, radar, etc.) the 105-mm achieves practically the same lethality rate. Pound for pound, then, the 105 is actually *more* effective against many targets. The obvious disadvantage of the M102 is the lack of a nuclear capability; however, this would be provided from corps assets.

**CPT (P) Judson B. Baggett, FA, was 101st Division Fire Support Officer during REFORGER.**




**Eerie lights as helicopters in their "shrouds" await loading on transport.**

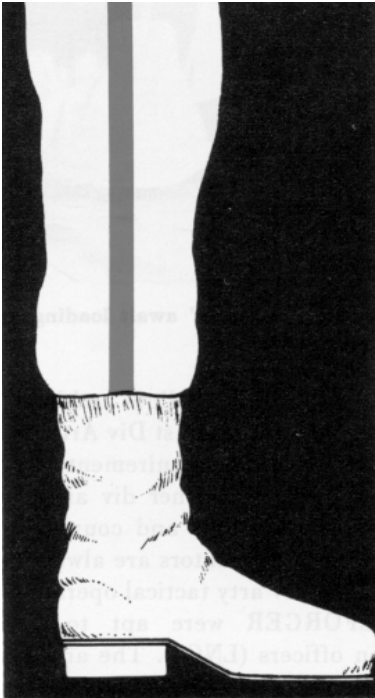
There is a valid requirement for both medium and heavy field artillery to reinforce the fires of the 101st Div Arty and to provide the nuclear capability. This requirement is no more valid for 101st Div Arty than for other div arties if they are to provide close supporting fires and counterfire for their divisions. Fire support coordinators are always in short supply, and visitors to the div arty tactical operations center (TOC) during REFORGER were apt to find themselves acting as liaison officers (LNOs). The artillery group headquarters in each corps proved invaluable by assisting with coordination and communications and providing LNOs, thereby giving the 101st Div Arty an improved command and control capability. This greatly facilitated planning and conducting passages of lines and other difficult coordination operations. The artillery group headquarters provides a significant pool of expertise, personnel, and equipment that can function for limited periods as an alternate div arty TOC and greatly improve the flexibility of the force artillery commander.

## Mission Accomplished

Many wondered how the 101st would fare on REFORGER and whether it would be able to survive in the mid-intensity environment. To the 101st, REFORGER 76 was a tremendous exercise — tough and demanding throughout each stage. The 101st returned to CONUS proudly, and justifiably so. It accomplished its missions and proved to us, as well as allied officials, its capability and relevance on the European battlefield. The air assault artillery had the opportunity to show the effectiveness of air assault artillery on a large-scale for the first time since Vietnam and for the first time ever on the European battlefield.

In the words of General Blanchard, USAREUR Commander-in-Chief, "The division demonstrated convincingly its mobility and firepower in both defensive and offensive operations. There is a role for the 101st in Europe, particularly in combination with armored and mechanized units. Its mobility permits rapid lateral movement coupled with significant antiarmor capabilities."

Air assault, sir! 



# Redleg Review

THE EASTERN FRONT 1914-1917, by Norman Stone, New York, Charles Scribner's Sons, 1975, 348 pages, 10 maps, \$15.

Professor Stone is a Lecturer in History at Cambridge University, England. He has written a remarkably challenging book; one which will upset the ideas of many historians on the facts of World War I and give field artillerymen a fascinating picture of Russian artillery in that war.

This is the first important work on the Eastern Front written in English since 1927, when Winston Churchill wrote *The Unknown War* (Vol. III of *The World Crisis 1916-1918*). In his pioneering work, the future prime minister took issue with the prevailing attitude that Germany had had an easy time of it against the backward Tsarist armies and that the Russian contribution had been small. In the book he developed his "Eastern Front thesis," contending that the great Allied offensives of 1915, 1916 and 1917 were ill-conceived and that more attention should have been paid to shoring up the Russian effort in the East. In World War II he was to revive this thesis, in partnership with Franklin Delano Roosevelt, and launch a Lend-Lease effort which made a major contribution to victory. Professor Stone's researches now raise doubt as to whether Churchill's thesis would have proved sound in World War I.

Stone started to write his book with the assumption (which most people share) that the Russian Army lost battles because of crippling materiel shortages due to the economic backwardness of the Tsarist state. His investigations show that the shortages have been exaggerated and were, at bottom, a hard-luck story.

Professor Stone spent much time in research in Russian, German and Austro-Hungarian sources. His chief source on matters of artillery is Yevgeniy Barsukov, author of *Preparedness of the Russian Army for War with Respect to Artillery* (translation of title).

Stone's revealing study shows that Russia's weak point was not her industry but the structure of her army, including the relationship of the infantry and artillery, and military strategy, tactics and transport.

World War I overrated artillery. Huge armies, with 20th century supply, moved with less than 18th century speed and they lost their ability to maneuver. Generals depended upon their artillery to blast holes in fixed enemy defenses — in the French phrase, "artillery conquers, infantry occupies." There was an alternative — it boiled down to better training of the infantry and closer coordination with artillery.

There was little love lost between the infantry and the artillery. Artillery was poorly represented on higher staffs. Commanders at successive echelons surreptitiously held out stockpiles of artillery ammunition — a hedge against future shortages that tended to create those very shortages.

Russian artillery was not centrally controlled and infantry commanders down to battalions commanded their support artillery. In consequence, individual batteries were given work to do that the artillerymen thought was the infantry's business (i.e., breaking up enemy patrols). Artillery experts blamed the infantry for wasting shells. The Russian artillery was itself a bastion of reaction and not free from blame.

A cause of wasted shells lay in the retention of eight-gun batteries through 1916, even after the introduction of rapid-firing guns had made the six-gun batteries of the Germans (or even the four-gun batteries of the French) sufficiently effective. Since field grade officers commanded eight-gun batteries and captains commanded six-gun batteries, this conservatism preserved the promotions and pensions of more senior officers.

Winston Churchill failed to rescue the "Unknown War" from the dustbin of history. Norman Stone may not do so either; however, it will be through no fault of his own. His is a much better

AMATEURS AT ARMS, by George Wunder, Stackpole Books, Harrisburg, PA, 1975, 96 pages, \$9.95.

This is a brief, beautiful book commemorating both well-known and obscure events from the American Revolution. The author, or better, the artist, selected vignettes from our nation's first war, composed them in highly readable style and rendered beautiful, painstakingly detailed paintings to accompany and vitalize the narrative. The pictures are full color and printed on 8- by 11-inch paper, suitable for framing. Five of the paintings prominently feature artillery pieces.

Wunder sought out the stories of craftsmen, fishermen, farmers and other ordinary citizens who were swept up into the war to face a trained, organized and equipped professional military force. These stories are not of the great battles where thousands faced thousands and events were planned on large battle maps. In *Amateurs At Arms* we find the individual revolutionary performing the heroics that only occur singly.

This book gives a different, interesting and complementary light to the voluminous historical data presented in the media during our bicentennial year. *Editor.*

researched account and was not written to prove its interesting and original conclusions. These conclusions emerge by themselves, simply and convincingly, from the vivid account the younger Englishman has written. Any American field artilleryman will know more about the Russians and more about artillery after reading this book.

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THE SWORD AND THE PEN, prepared by Sir Basil Liddell Hart, edited by Adrian Hart, Thomas T. Crowell Company, New York, 1976, \$10.95.

The selections for this collection were made by the eminent military scientist, Sir Basil Liddell Hart, who died in 1971. For more than 40 years, he was consulted by the leaders and generals of many countries, and Sir Basil's writings include *A History of the Second World War and Strategy*.

The work on *The Sword and the Pen* was completed by his son, Adrian Liddell Hart, who had wide experience in war, serving with the British Navy in WWII and the Foreign Legion in Vietnam, as well as with the United Nations forces.

It is an important new collection of the major works of the most significant military writers from biblical times to the present. This book is an exploration not only into war, but into the minds and natures of those who have engaged in it with 'sword and pen.'

The 77 separate selections in the anthology include the thoughts and strategies of such figures as Caesar, Michiavelli, Cromwell, Clausewitz, Lincoln, Tolstoy, Lenin, Churchill, MacArthur, DeGaulle, Hitler and Mao Tse-Tung. The introduction, though somewhat lengthy, makes interesting reading as it gives the reader an insight into what Sir Basil and his son sought to accomplish in preparing this collection.

This volume does not follow an academic pattern but is a comprehensive and fascinating collection which will be welcomed by both serious historians and armchair generals alike.

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THE GIs: THE AMERICANS IN BRITAIN 1942-1945, by Norman Longmate, Charles Scribner's Sons, New York, NY, 1975 \$12.50.

Norman Longmate, also author of *If Britain Had Fallen* and *The Real Dad's Army*, among others, researches his subjects exceedingly well.

The first portion of *The GIs* provides a good, brief background of events leading up to the entry of the United States into World War II. Longmate continues with an excellent portrayal of the build-up of the American Army and its Air Force for the fighting in Africa, strategic bombing of Europe and the final assault of the Continent, to include the initial support of reinforcements and supplies and the continuing medical support.

The writing is primarily an account of the day-to-day relationship of the Americans and the British. The book contains firsthand accounts by contributors, directly or indirectly quoted. As such, it should be very accurate; in this regard, one should not be misled by the minor errors in organization identifications. The book sometimes becomes tedious reading, and some repetition will be noted as the author attempts to make each chapter a story within itself.

Tales of the GIs' behavior may shock some and merely amuse others. One should remember that the bad always stands out more than the good; on balance, however, the "Yank" image comes off very well.

*The GIs* must be read very carefully as one could get an entirely different impression than that intended by the author. No punches are pulled. All facets of the relationship (good and bad) between the Americans and the British — all the problems and all the happy times — and all the results of the long association between the two are covered in great detail.

*The GIs* is not for the reader of light material, but it is a must for serious students of WWII and those involved in that war. Those who were there may appreciate the nostalgia. The young just may be entertained by a glimpse at "Dad's Army." The author has tried to show the humor of situations where it is in good taste — but an appreciation of British humor is a prerequisite.

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WHY NATIONS GO TO WAR, by John G. Stoessinger, St. Martin's Press, New York, 1974, 320 pages, \$8.95.

Conventional wisdom has attributed war to such abstractions as nationalism, militarism, alliance systems, economic factors and even human nature. Dr. Stoessinger writes that he was not satisfied with these "non-human" causations and wants to understand the personality dimension behind war. The result of his study is *Why Nations Go To War*. As a vehicle, he uses six case studies of the major international wars fought in this century: the two world wars, Korea, Vietnam, Indian-Pakistani and the Arab-Israeli. The author explains,

*What interested me most in each case was the "moment of truth" when leaders crossed the threshold into war. I decided to "blow up" that fateful moment, to capture it in flight, as it were, in all its awesome, tragic meaning. In the process, I sought answers to the questions that have always haunted me: At what moment did the decision to go to war become irreversible? Who bore the responsibility and why? Could the disaster have been averted? Did the six cases, different though they were, reveal some common truths about war in our time?*

The answers to these questions, as proffered by Dr. Stoessinger, provide compelling reading. The case studies are brief but meaty and, while the story each tells has been oft repeated, the psychopolitical approach used by the author provides a new and fascinating vantage point.

The final chapter of the book presents the "common truths" which Dr. Stoessinger gleaned from his case study analyses. Among these are some provocative comments on the role of leader misperception, i.e., distortions of himself, of his adversary and of his adversary's intentions and capabilities, as a major cause of war. Interestingly, the author emerges from his study with a note of hope. He senses that man has learned from the past and that war is now avoidable.

*Why Nations Go To War* deserves a wide reading.

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