

FIELD ARTILLERY JOURNAL

November-December 1975



FIELD ARTILLERY JOURNAL

Volume 43

November-December 1975

Number 6

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 1910:

"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.

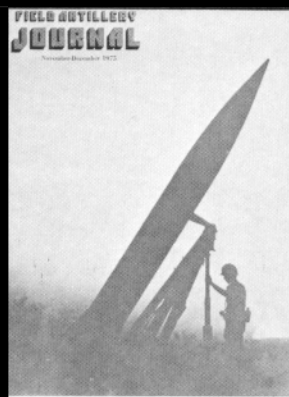
Funds for the printing of the publication were approved by the Department of the Army, 1 September 1973.

All articles and information submitted are subject to edit by the **Journal** staff; footnotes and bibliographies will be deleted from text due to limitations of space.

All letters and articles should be addressed to Editor, **Field Artillery Journal**, PO Box 3131, Fort Sill, OK 73503, AUTOVON 639-5121 or Commercial (405) 351-5121.

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

Subscriptions to the **Journal** may be obtained through the Field Artillery Historical Association, Fort Sill, OK 73503. The rate remains \$6 per year.



Although we've published this photograph before (inside March-April 1975 Journal), we think you will agree that it makes an excellent cover.

THE FIELD ARTILLERY SCHOOL

COMMANDANT

MG David E. Ott

ASSISTANT COMMANDANT

BG Albert B. Akers

THE FIELD ARTILLERY JOURNAL STAFF

EDITOR

MAJ Alan A. Word

MANAGING EDITOR

Ms. Jacqueline L. Snyder

ASSISTANT EDITOR

Ms. Mary Corrales

STAFF WRITER AND CIRCULATION MANAGER

2LT David Long

EDITORIAL ASSISTANT

Ms. Elaine Henrion

PRINTER

*Anchor Printing
Fort Worth, Texas*

Articles

- From Aachen to Zwolle** 7
by CPT Peter M. Ossorio
- Counterfire!** 14
- The Electric Company's FDC** 25
by CPT Anthony N. Kuykendall
- The Field Artillery in Vietnam
Part IV (continued)** 29
by MG David E. Ott
- On Target Acquisition . . . Again** 35
by COL (Ret) Arthur R. Hercz
- Division Covering Force** 42
by LTC Ronald B. Stevens
- Helbat 5** 50
by MAJ Jean Reed

Features

- A word from the editor** 2
- Incoming** 3
- Forward Observations** 6
- With Our Comrades In Arms** 22
- View From The Blockhouse** 46
- Right By Piece** 56
- Redleg Review** 60
- Redleg Newsletter** 61



pg. 7



pg. 22



pg. 42



pg. 50



pg. 56

a word from the editor

The times, they are a-changin'—

Bob Dylan, 1963

This is the best way we can think of to describe our feature article this month. We refer, of course, to "Counterfire." A great many changes have been made to the Field Artillery over the last years; however, the idea of giving the old counterbattery mission to the division artillery commander has to rank as the most significant and evolutionary to date. We recommend that you read the Commandant's "Forward Observations" prior to reading the article to properly set the stage. Special thanks go to a former contributor, MAJ Ronan Ellis of the Target Acquisition Department, for his work on the Counterfire training circular as well as the article.

HELBAT is with us again. Our last episode, you will remember, took us from the HELBAT 1 through HELBAT 4 tests. MAJ Jean Reed, the USAFAS project officer, has given us an update on the HELBAT 5 series conducted at Fort Sill in June.

We have a truly outstanding group of articles in this issue from Redlegs in the field. LTC Ronald Stevens leads off with a discussion of FA support of the division covering force. We are especially proud to publish articles of this nature. Lieutenant Colonel Stevens has taken some of the new FA doctrine and tactics and applied it to his particular situation on the border in Europe. We know that many units are testing the new ideas, and we encourage you to share your experiences with all of us through the *Journal*. The test of any new doctrine is its successful application.

CPT Tony Kuykendall and his unit (C/2-14th FA) recently returned from Germany, and they are sharing with us the design of their fire direction track. After reading the article, it is easy to understand why his unit was called the "Electric Company." We would be remiss if we did not mention Tony's FDO, LT Christopher Strauss, who developed most of the modifications and provided the outstanding illustrations. These are by far the best freehand drawings of FA materiel that we have ever run across. The Electric

Company has informed us that they are now hard at work on another article for us on battery communications. We eagerly await it.

Brigadier General Akers, the Assistant Commandant, brought CPT Peter Ossorio's article, "From Aachen to Zwolle," to our attention. It was first published in *Military Review* and we believe you will agree that it merits republication in the *Journal*.

COL (Ret) Arthur Hercz, a former director of the Target Acquisition Department, provides an alternative point of view to the TA problem in his article. While you may not necessarily agree with Colonel Hercz, you can hardly discount his experience.

Rounding out our issue is the Vietnam Monograph.

A great deal of emphasis currently is being placed on the combined arms team. To help foster this spirit of cooperation and coordination, we have initiated a new feature, "With Our Comrades In Arms" (credit Jackie Snyder, our managing editor with the title). Although this month's feature deals with materiel items, we do not intend to limit it to that. We are looking for any item of interest to the other branches that should be brought to the attention of our readers.

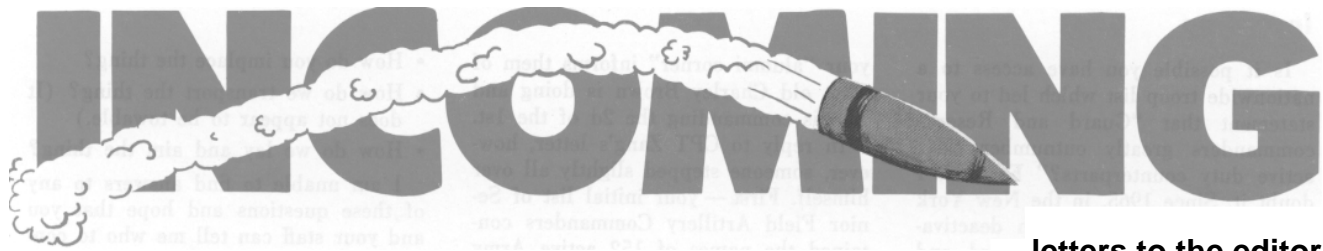
We are pleased to announce that a medallion has been struck for those women who became members of the Order of Molly Pitcher while at Fort Sill. The medal, shown here, may be obtained by writing the Protocol Office, PO Box 3118, Fort Sill, OK 73503. A fee of four dollars must be included to cover the cost of the medal.



In the time-honored tradition of saving the best until the last, we have two new staff members to introduce. Mary Corrales, our assistant editor, is not really new. She provided invaluable assistance to us when we published our first two issues through the Fort Sill Army Field Printing Plant back in July and October 1973. We are most pleased to have her as an official member of the staff. Elaine Henrion comes to us by way of Fort Riley. A horsewoman by hobby, Elaine is already proving to be an excellent editorial assistant. She, also, is most welcome.

Enjoy your *Journal*!

editor



letters to the editor

3d Infantry Division

Dear General Ott:

Cleaning off my desk for an all too early departure from this great job, I find that I owe you a letter on our fire support techniques. Hopefully, you will find these remarks useful for incorporation in a *Field Artillery Journal* article or in your "Forward Observations" column.

Before getting down to specifics, let me admit that none of these techniques is absolutely new or original. Many are tried-and-true methods which had fallen into disuse, while others have been borrowed from your *Journal* or from the excellent series of training circulars your folks are turning out. But original or not, these are techniques we are actually putting into practice in our training and our tactical planning.

The first priority, as we see it, is to make artillery support more *responsive* to the maneuver commander. To accomplish this, we began last winter (on WINTEX) to decentralize control of fire support to the DS artillery battalion. Div arty did not relinquish command in a formal sense, but it was emphasized to the brigade commander and DS battalion commander that the latter was to operate as if he were an organic part of the brigade. The div arty battalion and two 8-inch battalions from corps were given straight reinforcing missions, so the brigade commander knew that he typically had a "brigade slice" of two FA battalions. When the situation so indicated, we "dedicated" a battery to a maneuver battalion or even to a company operation.

When necessary to maintain continuous fire, we split batteries for short periods of time. These techniques have been practiced in our field training since then and have been incorporated in our ORTTs this spring and summer.

During field training in the spring we determined that our conduct of fire missions was just too slow. To correct this shortcoming, we've put renewed emphasis on speed in the howitzer section (we'll have a competition for best section in div arty built into our battalion

ORTTs this summer) and on the part of the FO. To recapture the maximum number of "wasted seconds," we've redesigned our battery and battalion FDCs, eliminated the exec post entirely (the XO's gamma goat is now a "Jump FDC") and set up a quick double-check system for producing "ready but not safe."

The next task was to reduce the vulnerability of our firing batteries and battalion TOCs which we think will be prime targets for Soviet artillery in time of war.

First, we've developed and frequently practiced offset registrations, using the ABCA method habitually. Assuming that German 1:50,000 maps are good (as you know they are), we then permit transfer, without survey, without limits of 400 miles in deflection and 3000 meters in range. I know this sounds pretty crude, but we feel that the diminished accuracy is more than made up by speed against fast moving targets and by reduced vulnerability. We also move batteries frequently and plan to prestock ammunition in caches for quicker displacement without dragging too large an ammunition "tail."

Two other passive measures will help us evade the Soviet's excellent target acquisition capabilities. First, we are teaching our battery commanders to pick positions behind hill crests to avoid the other side's long-range, flat-trajectory weapons — but not too far in defilade, lest we lose the ability to fire as low a trajectory as possible to get under the enemy's radars. Second, our battalions and our FSOs will use directional antennas on their FM radios which communicate rearward, thus cutting down on "electronic signature."

Our third priority has been to enhance mutual understanding between members of the *combined arms team*. To this end, the DS battalions provide FOs and FSOs to all maneuver unit training exercises and provide training in calling for and adjusting fire to maneuver unit officers and NCOs. The M31 trainer has proved to be very popular with our infantrymen and tankers and was particularly effective in our recent EIB

testing. We're also training our FDCs to process simple missions in the German language and our associated German units are doing the same with English phrases.

Each of our brigades has been working hard on detailed planning of "kill zones" in its assigned sector and the FSOs are playing a big role in "the first three days" of any war over here. By the way, although doctrine doesn't make the FO the FSO of the supported company, some of our young lieutenants have shown a lot of initiative and imagination in this regard on our "no notice" company-level tests. A tip of the hat to Fort Sill's fine schooling!

... I've encouraged my artillerymen to do a "kill zone" case study for the *FA Journal*, so I hope you'll be hearing from them soon. Until then, I hope these thoughts will prove useful.

E. C. Meyer
Major General, USA
Commander
3d Infantry Division

For more information on happenings in the 3d Infantry Division, see LTC Stevens' article on page 42.—Ed.

Reserve Commanders

After reading your request for Annual Readership Survey Forms, I am delighted to submit mine. I acknowledge your explanation that I am aiding the *Journal* by doing so. Now, let's see how you handle my request which, I firmly believe, will also aid the *Journal*.

I request that you adopt Captain Zang's suggestion (see his letter and your reply in the May-June issue) that commanders of National Guard and USAR artillery units be included in "Commanders Update."

Your negative response to that suggestion is naive, to put it mildly. Although no doubt unintended, your response is an insult to National Guard and USAR units with lineages as famous, if not more so, than some RA units. You have displayed flagrant disrespect to commanders, their officers and men. I must be living in the past. I had no idea the "One Army" concept was dead and buried.

Incoming

Is it possible you have access to a nationwide troop list which led to your statement that "Guard and Reserve commanders greatly outnumber their active duty counterparts?" Frankly, I doubt it. Since 1965, in the New York metropolitan area, I've seen deactivations cut the number of Guard and Reserve artillery cannon battalions from over 15 to about six at this writing. Two group headquarters, a corps artillery headquarters and a target acquisition battalion also disappeared. The same knife must have been deftly wielded in other parts of the country.

But, if you are correct about the comparative number of commanders, then all the more reason why the *Journal* should give recognition in the same way active-duty commanders are recognized. Again, if you are correct, then it follows that the majority of your readers are Guard and Reserve personnel and that fact should be increasingly recognized.

You go on to say that "limitations of space" prohibit the listing of reserve component artillery commanders. What's the big deal? As I skim pages of recent issues of the *Journal*, I find valuable space given over to art work and photos as part of almost every article. In all fairness, is the number of names and units involved that great? (I wish it was, for the good of our nation.) In the interest of giving credit where credit is due, you can, I am quite sure, overcome these so-called limitations of space. In closing, Mr. Editor, your policy needs a 3,200-mil correction. Otherwise, eliminate "Commanders Update" altogether.

Americo J. Porzio Jr.
MAJ, FA, USAR (Ret)
Brooklyn, NY

PS—Where is our red tie with gold cannons?

CPT Joseph H. Zang, Maryland National Guard, brought to surface an interesting complaint in your May-June 75 issue.

His point was that the list of Senior Field Artillery Commanders, first published in the January-February 74 issue and subsequently updated, only contained the names of active Army field artillery commanders.

I think your idea of restricting the list to active army commanders is feasible. Most active Army artillerymen have crossed paths in their careers and your

"alumni corner" informs them of what old Charley Brown is doing and who is commanding the 2d of the 1st.

In reply to CPT Zang's letter, however, someone stepped slightly all over himself. First — your initial list of Senior Field Artillery Commanders contained the names of 152 active Army field artillery commanders. Second — if you would check with AWTSD or your own mailing list you'll find that there probably are about 155-160 senior reserve component Field Artillery commanders (my interpretation of senior FA commanders incidentally is restricted to FA battalions, groups, div arty and corps).

I hardly think that a prudent person would consider 158 versus 152 as being "greatly outnumbered." Outside of the above, I think the *FA Journal* is the best thing to come along since sliced bread and TEC.

James C. Ewald
LTC, FA, WI ARNG
1st Bn, 121st FA
Whitefish Bay, WI

Major Porzio and Lieutenant Colonel Ewald are correct, of course. National Guard and Reserve FA units do not "greatly outnumber" their active counterparts — we blew it! The number is significant enough though, to cause us space problems. We mean no slight to the Reserve Components; we have in the past and will continue to publish articles and information of particular interest to you. We're in a situation where "you can please some of the people some of the time. . . ." The Fort Sill PX has sold out its initial stock of red FA ties, but more have been ordered.—Ed.

Who and How

This battalion was recently issued three Launcher, Rocket: Multiple, 115-mm, M91. The TOE calls for them to be assigned to the battalion supply section of the service battery. I have been able to identify the maintenance manual (TM 9-1055-215) and the firing table (R115-C-1.)

What I have not been able to find is reference material on the employment of this weapon. As the battalion training technician I am being asked questions like:

- Who fires the thing, surely not the supply section?
- How do you implace the thing?

- How do we transport the thing? (It does not appear to be towable.)
- How do we lay and aim the thing?

I am unable to find answers to any of these questions and hope that you and your staff can tell me who to contact to find this information.

Carl McPhetride
CPT, FA
2d Bn, 146th FA, WA ARNG
Vancouver, WA

The information you seek is in FM 6-54. It may be obtained by writing: AG Publication Center, 2800 Eastern Blvd., Baltimore, MD 31220 — Ed.

Arty In Villages

I happened to pick up the July-August 1975 edition of the *Journal* from the desk of a field artilleryman colleague, and, while leafing through it to pass the time, came upon MAJ Robert Scales' article on positioning batteries in European villages. It was refreshing, to say the least.

When I last served in Germany, we were practicing to fight the Korean War on the plains of Europe just as many units today are practicing to fight the Vietnam conflict. Major Scales' lucid reminder that we have centuries of historical precedents for the conduct of combat in an environment which has changed only in degree, not in substance, was definitely on target.

Anyone who has taken the trouble to assess the possibilities of rural German villages, instead of simply riding through or around them on maneuvers, has seen what deliberately planned and situated fortresses they are. Yet, as Major Scales points out, we all too often tend to ignore these villages as potential strong points and obstacles, both for the enemy and for ourselves. Maneuver damage claims outweigh the desire of pragmatic commanders to use the environment realistically.

Lastly, it was edifying to see that Major Scales placed the battery CP in a *gasthaus* in his schematic. For that suggestion alone he should win the unending plaudits of field artillery captains, first sergeants and battery clerks, world-wide.

William C. Westgard
LTC, GS (Infantry)
OCSA

Traveling Guidons

I would like to pass on some information that you probably haven't received pertaining to two field artillery battalions.

On 21 June 1975, the 1st Battalion, 82d Field Artillery, at Fort Bragg was redesignated as the 1st Battalion, 6th Field Artillery. Concurrently, the 1st Battalion, 6th Field Artillery, at Fort Hood was redesignated as the 1st Battalion, 82d Field Artillery.

LTC James B. Linclon assumed command of the 1-6th FA on 23 June 1975 at Fort Bragg from the out-going commander LTC Frederick R. Daly. LTC Daly is now assigned to the National War College at Fort McNair. LTC Linclon's previous assignment was S4, XVIII Airborne Corps Artillery, Fort Bragg.

On page 59 of the July-August *Journal* you indicated that LTC Linclon commanded the 1-82d FA. The item should read that he commands the 1-6th FA.

SSG David S. McQueen
Bn Information NCO
1st Bn, 6th FA

Overlooked

Today we received our latest copy of the *Field Artillery Journal*, July-August 1975. Upon reading the article entitled, "FA—A Choice with a Future," I noticed the article mentioned Lance as being currently fielded at Fort Sill and in Germany.

At this time, I would like to bring to the attention of the *Field Artillery Journal* and its many readers the officers and men of the 12th US Army Field Artillery Detachment who have the distinct honor of serving and being associated with the first NATO Lance unit located at Oderzo and Codogno, Italy. The officers and men of the 12th serve proudly with this distinction.

We look forward to receiving the *Journal* — a magazine by professionals for professionals. Please keep up the outstanding work.

William J. O'Donnell II
1Lt, FA
Team Commander
1-12th USA FA DET
Oderzo, Italy

Our apologies for overlooking you.—Ed.

Plexiglass Shield

Hooooooooooooonnnkk!

However meritorious the Plexiglass shield of the safety device invented by MSG Mitchell ("View From The Blockhouse," May-June 1975 *Journal*) may be for testing and training in friendly surroundings, I wish to advise users to never take it to the field against an adversary. It invites a lot of trouble from the counterbattery guys who can spot the plastic sheet as easily as a mirror on a sunny day.

In explanation of this rather obvious phenomenon I suggest the following test to your readers.

Take a Poloroid sunglass, close one eye and look with the other through the sunglass at an automobile window — Plexiglass! Rotate the sunglass at a 90-degree angle to the window and observe the reflections. Afterwards, nobody will be able to convince you that the bad (and smart) guys can't see the device:

- From a great distance.
- Through moderate camouflage.
- In a pitch-dark night even with yesterday's electro-optical detection instruments.

Reinhold Gerharz
Bethesda, MD

Thanks for the tip. The Plexiglass arc was recently eliminated during modification (see "View From The Blockhouse") — Ed.

Update

I thoroughly enjoy the *Field Artillery Journal*. It is certainly a big help to keep people up-to-date on what is taking place, particularly with respect to new developments.

I have one question. I enjoy seeing your "Commanders Update" but I am a little at a loss to understand why you refer to the units, for example, as "2d Battalion, 37th Artillery." I thought we called our battalions field artillery and referred to them as 37th Field Artillery.

J. A. Seitz
Brigadier General, USA (Ret)
Junction City, KS

You are right. If you will check Commanders Update in this issue, you will see that we have changed — Ed.

2-138th FA

While perusing the "Incoming" portion of the July-August issue, my attention was drawn to "Fire Mission." In response to 1LT Tony R. Fuller, perhaps my firsthand comments can enlighten his thoughts or someone else's for that matter, in regard to the performance of the 2d Battalion, 138th Field Artillery, while in Vietnam.

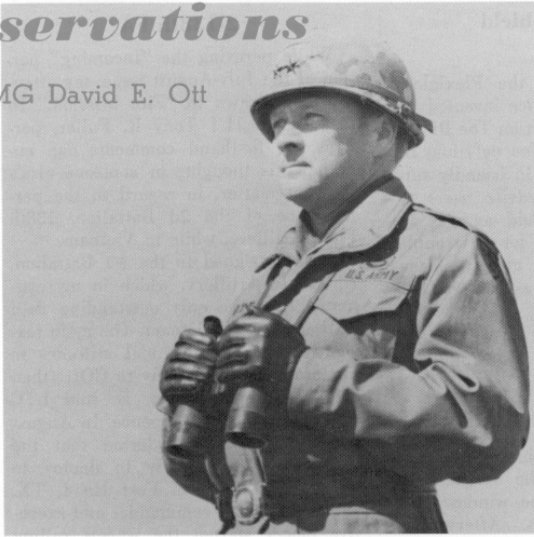
I was assigned to the 1st Battalion, 83d Field Artillery, which in my estimation was the only outstanding field artillery unit in Vietnam. The main reason for such professional attitudes in our unit was due largely to COL (then LTC) Clifford Worthy Jr. and LTC (then MAJ) Ray L. Spence. In August 1968 our unit was alerted that the 2-138th FA was ready to deploy to Southeast Asia from Fort Hood, TX. Immediately our commander and executive officer started the wheels rolling for proper reception of the unit. The reception plan included the acquisition of real estate, equipment for health and welfare of the unit personnel and pre-stockage of all logistical base.

The 2d Battalion, 138th Field Artillery, began arriving at Da Nang, Vietnam, in October 1968. Wheeled vehicles were conveyed to Phu Bai, and the tracks were transported by LST to Tammy Bay near Hue. It was immediately apparent that the unit was going to play a very important role in the accomplishment of the combat mission of XXIV Corps. The officers, NCOs and lower ranking EMs were a proud bunch who truly displayed professional leadership and accomplishments. The unit's personnel were very maintenance conscious and proud of their work. Their professional attitude and accomplishments are truly worth mentioning in that they gave us, the sponsor battalion, a run for our money. If at any other time the 2d Battalion, 138th Field Artillery, is recalled to active duty, I would not hesitate one minute to be able to serve with them. As the individual who was the key man in planning and receiving them, I salute with great pride LTC Robert W. Cundiff and his staff for a truly outstanding professional combat performance. The National Guard Bureau and the State of Kentucky should be very proud of the accomplishments of the 2d Battalion, 138th Field Artillery.

Benjamin M. Frias
MSG, USA
HQ, 552d Arty Gp

forward observations

MG David E. Ott



I invite your attention to an article in this issue which I believe will be of great significance to all field artillerymen, indeed to the combined arms team. I refer to the counterfire article on page 14.

As a result of almost 24 months of constant and exhaustive study, coordination and testing, we are implementing a major change in field artillery doctrine. The change deals with the old counterbattery mission which we are now calling counterfire.

In the past, counterbattery was the mission of the corps artillery commander. He had the assets; primarily, longer range weapons and the equipment of the target acquisition battalion. More often than not, he was blessed with a relatively stable corps front and was able to successfully conduct his counterbattery mission across it.

We are moving that mission to division and div arty will now control counterfire! We believe that the counterfire function belongs at division artillery for several reasons. Corps frontages have greatly increased. The old WWII corps frontage of 40 kilometers is the same as or greater than that of the divisions deployed today along the border in Europe. This will result in an unmanageable number of targets and an overextended communications system. In addition, the corps artillery commander is going to be removed an unacceptable distance from the scene of battle. Coupled with this new, greatly expanded battlefield is the fact that our current divisions (especially armored and mechanized) have a much longer reach and pack a heavier punch than did their WWII counterparts. Having the necessary "muscle," though, is only half the problem. As COL Don Rhea of our Target Acquisition Department pointed out in a recent *Journal* article ("Target Acquisition Today . . . Tomorrow," March-April 1975), today's divisions will definitely need certain assets of the target acquisition battalion on the next battlefield. I assure you, we are hard at work to obtain those assets in the form of a new, improved TA battery for the division artillery

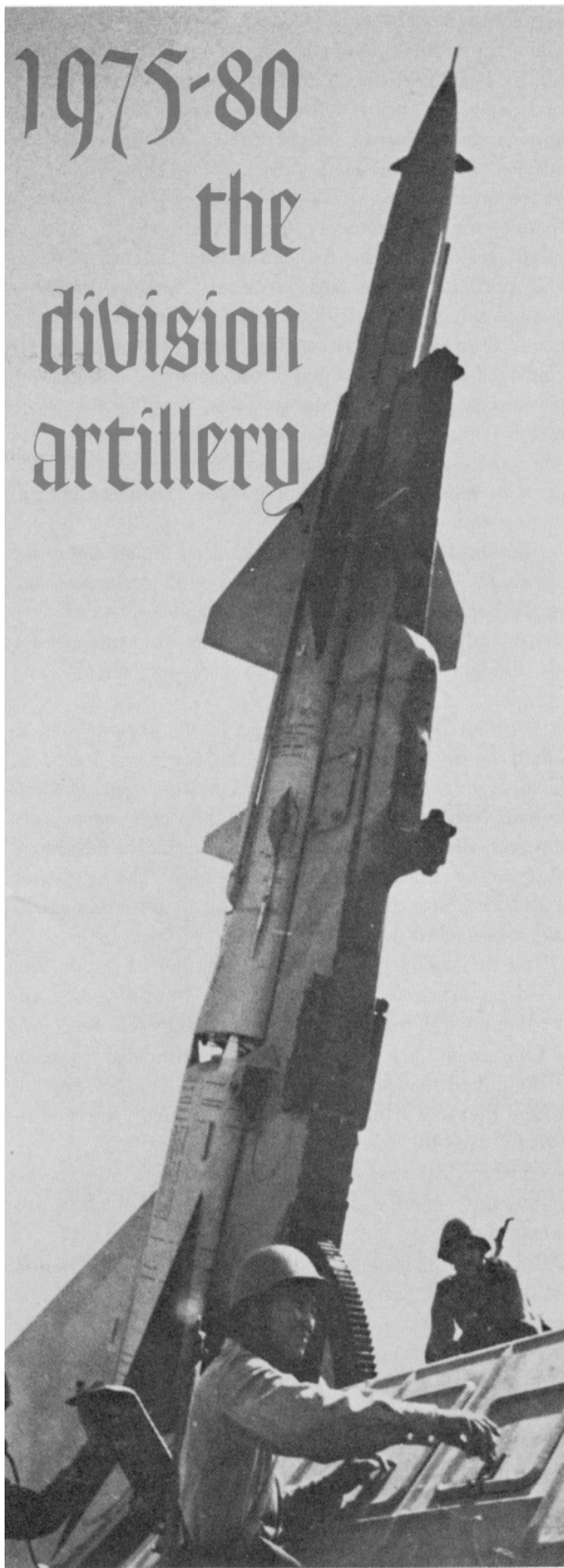
commander as you will see later.

In order to give the division artillery commander the full capability to handle the counterfire mission, we felt three changes were necessary. First, as I have mentioned, he has been given target acquisition assets. They will be, of course, TOE organic to the division. Second, the division artillery staff has been beefed up. We will now have in the division artillery a tactical operations center (TOC) that has within it a target production capability. This TOC has some new skills and some grade structure that will provide it with the capability we need. But thirdly, the div arty commander must have control of the cannons that can shoot within his sector. Therefore, we are changing our field artillery tactical doctrine to habitually place all corps artillery cannons in either a reinforcing role to one of the divisions or attached to the divisions. Thus, the corps artillery commanders still control the allocation of cannon battalions as a means of managing resources. But once battalions are earmarked for a division, they then fall under its control for positioning and for firing.

Thus, you can see the div arty commander has a way of finding targets, a means of developing intelligence into productive counterfire targets and the capability of attacking targets with all the cannons in his sector. The problem is not as simple as it seems, however. There are many intelligence resources capable of adding to the target production, and the division artillery commander's staff must use all of these intelligence resources so that they can contribute their part to the puzzle of locating enemy indirect fire systems. The various parts of the puzzle include, of course, the radar, sound and flash that are within the target acquisition battery. In addition, shell reports must be received from throughout the sector and analyzed to cue in other locating devices or to confirm suspect locations. Aerial photography, when available, must be searched since it is a very accurate and productive means of locating hostile guns. The Army Security Agency has equipment which cannot be discussed in detail here but which also adds immensely to our ability to locate the enemy. Obviously we must integrate all of the intelligence community's capability into our target production if we are to be successful.

This new responsibility placed on the division artillery commander does not in any way detract from his previous responsibilities for providing fire support to maneuver and, by giving him both responsibilities, we have a very interesting situation whereby the priority of fires can be determined and executed at division level. The division commander needs to understand fully that, in a situation where more targets are located than his artillery is capable of engaging, he must establish priorities. Thus, at times, the priority of fires may well be to attack the enemy's indirect fire system. At other times, the priority may be

(Continued on page 13)



1975-80
the
division
artillery

by CPT Peter M. Ossorio

Obscure names achieve familiarity through bloody transcription from map to battle streamer. "Army artillery is still outgunned by Soviet weapons — they have more of them and their's [sic] outrange US guns."¹ Both statements cast ominous shadows over the handful of austere divisions which will help meet our nation's foreign commitments in the last half of this decade. Division commanders, and those who would succeed them, should ask, "Can the division artillery adequately support a US division defending against a modern opponent?" Further, they should examine the tasks which they expect their division artillery to perform and assign priorities to them.

The need for candid inquiry coincides with a climate favorable to the effort. The US Army has emerged, possibly with unseemly haste, from the emotional and intellectual jungles of Vietnam. Proof of the exodus springs

The SA-2 Guideline SAM is standard in the Soviet Army (with SA-4 and -6) and throughout the Warsaw Pact and Soviet-backed countries. About 5,000 SA-2 are also in service with the Soviet Air Defense Command, together with 5,000 SA-3, -4 and -6. It is employed with a track-while-scan radar (Fan Song), has an HE warhead, a slant range of 25 miles and is effective between 800 and 8,400 meters altitude. A larger version first seen in 1967 has a nuclear capability.

from aachen
to zwolle

from the pages of nearly every issue of the military journals. Old ideas refurbished and new ideas advanced leaven the pages. "Force oriented defense," "zones of attrition," "overwatch" and "tank proof islands" all make their debut or stage revivals. The reader who never before heard of J. F. C. Fuller learns that the "Archipelago Defense" is neither an esoteric chess strategem nor a Russian novel.²

Unfortunately, few combat arms leaders discuss the role of the division artillery. Those who do focus on its traditional mission to "place effective fires well beyond the FEBA [forward edge of the battle area]" and the more recent practice of employing separate artillery platoons in strongpoints.³ This regrettable reticence may stem from the field artillery's success in image building. Would the "greatest killer on the battlefield" welcome advice on its efforts to "lend dignity to what would otherwise be a vulgar brawl?" The silence of combat arms authors reflects less a paucity of constructive opinion than a demonstration of their sense of professional courtesy and reluctance to "poach" on another branch's doctrinal territory. No artilleryman who has worked with a maneuver unit can doubt that combat arms leaders know quite a bit about the division artillery and possess definite views on its proper role.

The commander's rank probably provides an indication of his concept of the division artillery; his position influences the priorities he places on artillery tasks. For example, the troop or team commander values responsive, accurate, conventional fires. His squadron or task force commander realizes the importance of massing artillery fires. He understands that devoting a portion of artillery effort to counterbattery operations reduces US losses and contributes to the division's success. A brigade commander

emphasizes the division artillery's contributions to deception plans and economy of force measures. Division and corps commanders focus on the field artillery's ability to support the counterattack, provide nuclear fires and neutralize enemy delivery systems. Finally, a theater commander's interest might center on the division's special ammunition load (SAL) rather than on the division artillery per se. The field artillery staunchly denies that it ever is in reserve; senior commanders, however, might regard specific division artillery firing elements and portions of the SAL as reserve combat power—combat power to be withheld from the opening engagement, secured until the critical moment and decisively employed to ensure survival of the command and guarantee success for its operations. Thus, pending the publication of the views of combat arms leaders at all levels, one must assume that the division artillery will be called upon to fulfill a mission that includes a variety of conflicting tasks.

"Cotton candy looks nice, but isn't much good for chewing." General statements may build consensus, but rarely suggest solutions. The commander challenged to shape and express his views requires an armature for his thoughts — a framework to consider, change and complete.

A US division's greatest threat in the period 1975-80 would be an enemy similar to the aggressor found in Field Manual 30-102, *Handbook on Aggressor Military Forces*. Nuclear capable, highly mobile and numerically superior, the enemy would have the significant advantage of deciding when and where to attack. The aggressor would also have the important option of initiating chemical and nuclear warfare.

The division artillery's overall mission of supporting the division's defense contains three implied tasks, according to FM 6-20, *FA Tactics and Operations*:

- Continuous fire support must be provided to each committed maneuver unit.
- The division artillery must attain nuclear fire superiority over the enemy.
- Until nuclear release, the division artillery must maintain the potential for rapidly achieving nuclear fire superiority.

Combat arms leaders should be aware that the division artillery faces serious difficulties in accomplishing each task. In simplest terms, there is not enough *available* artillery. Paradoxically, more artillery is not the solution. Even partial resolution of the problem requires that maneuver unit commanders appreciate the limitations of the division artillery's resources.

During the latter half of the 1970s, the mechanized or armor division will contain only four battalions of field artillery. Each battalion consists of three firing batteries, each with six M109A1 (155-mm self-propelled) howitzers.

¹ "Memo . . .," *Armed Forces Journal International*, June 1974, p. 10.

² MAJ L. Wayne Kleinstiver, "The Archipelago Defense," *Infantry*, March-April 1974, pp 30-32; MG Donn A. Starry, "The Commander's Hatch," *Armor*, May-June 1974, pp 5-8—a stimulating discussion of overwatch; "Reflections on Infantry Training . . .," *Infantry*, January-February 1974, pp 13-17—US Army Infantry School interpretation of overwatch. Many authors seek to interpret past airmobile operations in Vietnam in the light of NATO commitments. Typical, but by no means the only, examples include COL(P) Walter F. Ulmer Jr., "Anti-Aircraft Employment on a Battlefield in South Vietnam," *Armor*, May-June 1974, p 25; and CPT Laurence K. Collings, "Possible-Feasible-Practical: Mid-Intensity Airmobility," *Infantry*, November-December 1973, pp 12-16.

³ Kleinstiver, *op. cit.*—a recent example, notable not so much for its brief reference to the field artillery's role as for the fact that it mentioned the artillery at all.

Three of the four battalions will be designed to provide, but not limited to, direct support to the maneuver units. They will provide liaison officers to brigade and battalion level and forward observers to each maneuver company. The fourth battalion will have three batteries containing four M110E2 (8-inch self-propelled) howitzers. Both types of howitzers can fire conventional, chemical or nuclear ammunition. The M109A1 can deliver standard high-explosive projectiles up to 18 kilometers. At the expense of a decrease in "tube life" and nearly a fivefold increase in cost, the M109A1 can fire rocket-assisted projectiles (RAP) to an increased range. Figures for the M110E2 are 24.5 kilometers for high explosive and an increased range for RAP. Thus, the division artillery appears capable of satisfying the current doctrinal requirement of one field artillery battalion for each committed brigade. But will one battalion be enough? The rosy picture fades in the unprecedented intensity of three familiar scourges from past conflicts:

- The enemy will destroy a portion of the division artillery.
- Specific firing units will be unavailable a significant amount of the time; they will be making frequent, short moves to avoid detection/destruction by the enemy.
- Howitzer breakdown rates will soar because of the cumulative effects of heavy firing and frequent displacement.

Computer simulations and extensive field tests would be required to even approximate the magnitude of each

factor, let alone unfavorable synergistic effects. However, a simplified, partially quantitative model gives some clues to the scope of the problem. Take the question of enemy detection and destruction. The more often a battery fires, and/or the longer it remains in one place and/or the closer its location to the enemy, the greater the probability that it will be detected and destroyed. There are also countervailing factors. For example, when many units fire simultaneously, they strain the enemy's target acquisition resources, thereby decreasing the probability that any one firing battery will be detected. The longer a unit stays in position, the better it can employ passive defense measures such as camouflage and field fortifications. Unfortunately, as soon as the unit fires a few rounds, it will be detected and forced to move to an alternate position. This raises the problem of nonavailability.

If each battery moves an average of once an hour, and the time required is 15 minutes, its availability has been reduced 25 percent.⁴ Since a future war will require

⁴ The 15-minute figure assumes a well-trained battery which can "march order" within three minutes, move to the alternate position in five and occupy and prepare to fire within seven. Use of emergency mission techniques ("hip-shoot") would not significantly increase the amount of time that the artillery is available. Army Training Test 6-165, *Field Artillery Battalion Medium/Composite*, 22 May 1967, p 27, allows up to 6.5 minutes for only two guns to prepare to fire an emergency mission.



BTR60 Armored Personnel Carriers fuel for operation.

more movement than previous ones, the howitzer breakdown rate may become a significant drain on fire support. Make the relatively optimistic assumption that 90 percent of the howitzers can move and shoot at the start of defensive operations. How long will that figure last? Within a few hours, it would probably diminish to 70 percent.⁵ The destruction of only seven howitzers would leave the division artillery in the position of trying to support the division's maneuver units with about three and one-half batteries!

Perhaps the hypothetical model of artillery support is too pessimistic. The division artillery has always faced these problems in the past and has handled them well in most instances. In any case, will not the enemy be handicapped to the same extent as US forces? Maybe. However, the aggressor possesses an unprecedented advantage. In addition to a highly sophisticated target acquisition system, the combat power of chemical and nuclear weapons employed in a surprise attack gives the enemy, for the first time, the possibility of completely destroying the division's artillery. Losses due to enemy action might well exceed the seven M109A1s assumed above. Even if the enemy artillery is forced to fire heavily and move often, it will retain a comparative advantage in availability rates since the aggressor uses a large amount of towed artillery. Equipment failure rates are lower and maintenance is easier on towed howitzers.

The combat arms commander will see little steel on the target. In the situation previously described, each squadron or task force could count on an average of a single battery firing one volley in direct support about

⁵Field tests could establish how much moving and shooting is required before a unit has 20 percent of its howitzers break down. A rough estimate could be made from the monthly readiness reports (Department of the Army Form 2715, *Unit Readiness Report Worksheet*, September 1971) and results of operational readiness tests (ORT) of specific units. Unfortunately, the data are not only classified, but sometimes unjustifiably favorable to the reporting unit.

⁶ If X equals the number of adjust fire (AF) missions as well as the number of fire-for-effect (FFE) missions, then the number of each type of mission that could be fired by the three and one-half batteries (mentioned on page 10) in a 24-hour period could be shown as: $X(\text{AF}) + X(\text{FFE}) = 3.5 \times 24 \text{ hrs}$. If we include the times mentioned in the second assumption for the respective missions (3 min for FFE or .05hr and 10 min for AF or .166hr), then our formula becomes: $.05X + .166X = 84$ or $X = 389$ of each type of mission, $2 \times 389 = 778$ missions. If we divide this number by the six battalion-sized units committed in the third assumption, the result is 130 missions per day or one mission every 11+ minutes. Naturally, if a larger proportion of fire missions were FFE, the division artillery could fire more missions. As the number of missions increases, limitations which are currently secondary become dominant—for example, problems of transporting ammunition, changing howitzer tubes and crew fatigue increase.

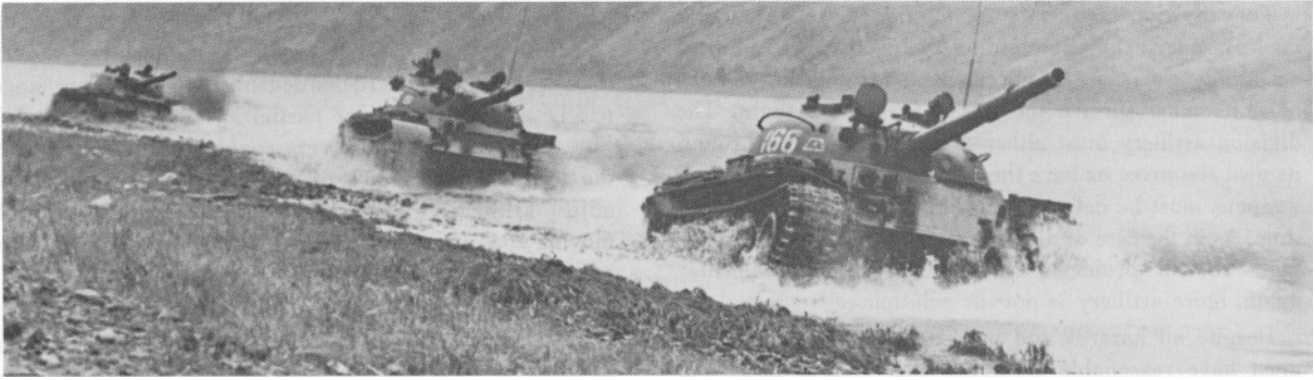
every 11 minutes. This low figure rests on the following assumptions:

- 1) Fire missions will be equally divided between preplanned "fire-for-effect" and "adjust fire" missions on targets of opportunity.
- 2) Firing batteries will meet the minimum criteria for a rating of satisfactory on army training tests. Fire-for-effect missions will require three minutes; adjust fire missions will be completed within 10 (ATT 6-165).
- 3) Six or more battalion-size units will be committed, thereby requiring direct support.

The division artillery would be able to provide a maximum of 778 fire missions in support of the division. Distributed among six maneuver units, this allows an average of one mission about every 11 minutes.⁶ Averages, of course, are deceptive. Units in heavy contact would receive priority of fires and could count on more units firing more volleys, more often. This improvement, however, would be at the expense of other units. The combat arms commander now has a tentative basis for deciding whether the division artillery is capable of



Decontamination of BRDM Scout Car following NBC exercises.



fulfilling the first of the three tasks implied in its mission to support the division's defense—continuous fire support must be provided to each committed maneuver unit.

How can the fire support be improved? One possibility involves the division artillery fourth battalion which may be available to reinforce the fires of the three direct support battalions. Unfortunately, it probably will be fully occupied with conducting conventional counterbattery operations, achieving nuclear fire superiority — or both. Although both activities benefit the division, neither provides the maneuver units with close support. A second possibility depends on corps artillery. But here, too, there are problems:

- Most of the corps artillery would be devoted to counterbattery and nuclear superiority operations.
- The corps commander might withhold the remaining nondivisional units to avoid their destruction during the opening engagements.

The easiest answer is to get more artillery. However, nontotalitarian societies must include moral, social and political variables in the economic "guns or butter" equation. At \$125,396 each, M109A1s dent tight defense budgets. Single firing batteries cost millions and the price of adding just one battalion to each overseas division would exceed \$50 million.⁷ A fiscally feasible and politically acceptable solution for the second half of the 1970s might include selective improvement and increased stockage of critical parts and howitzer subassemblies, increased field training in passive defense, tactical movement, recovery operations and improved fire techniques to shorten the time required to attack a target of opportunity.

⁷ Supply Bulletin 700-20, *Army Adopted/Other Items Selected for Authorization/List of Reportable Items*, November 1972, pp 2-48 and 2-146. Six M109A1s, their supporting ammunition carriers (M548) and the fire direction center (M577A1) alone cost over \$1 million. A complete battalion—depending on its requirements to carry ammunition, conduct artillery survey, generate its own meteorological data, have organic countermortar radars and so forth—could require 5 to 15 million dollars.

The 37-ton T-62 main battle tank has been in service since 1964, and the older T-54/55 on which it is based is now being slowly withdrawn. Most obvious external difference is the T-62's 115-mm gun with the fume extractor halfway up the barrel. The Soviet Army has 106 motor-rifle divisions (each with 188 battle tanks) and 51 tank divisions (each with 316 battle tanks).

Selective improvements could be designed to prevent breakage or malfunction during a few days of hard firing and frequent moving. This is not necessarily the same as lengthening equipment like in a peacetime motor pool.

Commanders' good intentions notwithstanding, there would be no time for training during the critical phases of the division's defense. Camouflage, light discipline, field fortifications and tactical occupation and organization of position areas will be no better than the division commander's standards during field exercises. Noncommissioned officers and junior officers who can drive vehicles, get them out of ditches, read maps and drag howitzers into positions will render effective fire support; those who can't, won't.

Rapid, surprise fire not only produces maximum effect on the enemy, it reduces the US unit's vulnerability to detection and destruction. As previously discussed, adjust fire missions reduce direct support to the combat arms by lowering the number of targets which can be engaged within a given period. Units overseas should prepare for possible hostilities by surveying not only emergency deployment positions (EDP), but also numerous supplementary positions along the routes to the EDP. Fire direction officers must master the most esoteric aspects of gunnery — and practice ignoring them when the need for speed overrides considerations of elegance and economy. Forward observers should strive for flawless location of targets under all conditions. Whenever possible, they should walk the potential battlefield with the supported unit and select adjusting points which will remain recognizable on a nuclear landscape. The tyranny of time during combat is only exceeded by its possibilities during peace.

The division artillery's remaining tasks, achieving nuclear superiority/maintaining the potential, encompass essentially the same requirements. A sufficient number of units must survive the initial enemy onslaught. The division artillery must either acquire its targets through its own resources or have the data furnished to it. Nuclear weapons must be delivered to the right place at the right time. As in the case of direct support, the division artillery faces several problems in meeting the requirements; again, more artillery is not the solution.

Despite all hazards and uncertainties, the commander must have reasonable assurance that critical units will survive. At the same time, he will want to provide his maneuver units maximum fire support. The two goals are largely conflicting; actions which move toward one jeopardize the other. Striking the most favorable balance between them involves assessing certain factors and determining the interactions among them.

- The probability that a unit will be destroyed varies if it does not fire until it receives a nuclear mission, is positioned deep in the division rear area and/or moves and shoots whenever and wherever necessary to provide conventional fire support.
- Each of the above benefits the division a varying degree; this benefit must be weighed against the damage done if the unit is detected and destroyed.
- The division commander sets an arbitrary standard. He must state the minimum assurance which he will accept that a given delivery unit will survive.

By considering the above factors, the division commander can decide whether employing a specific unit to provide conventional fire support entails an unacceptable risk. Although the division artillery commander will be able to supply valuable advice and some quantitative data, the decision rests with the division commander. The estimate depends more on the commander's professional judgment than on his slide rule.

Despite the prospect of artillery delivery of sensors, the division artillery's probable contribution to the division acquisition effort will probably range from disappointing to dismal. Division artillery radars are easy to locate, slow to move and likely to be destroyed or jammed at the worst possible moment. The prospects for aerial observation are even more disturbing. The wealth of information derived from even a few minutes over the battlefield may justify and force acceptance of unusually high losses. Unless the division or division artillery gains some unmanned aerial observation capability (drone, balloon and so forth), the division artillery will have to rely on manned helicopters. Even if actual experience shows a better survival rate than

predicted, the issue becomes a clear case of trading dollars for lives. Despite the most optimistic estimates of the helicopter's ability to survive on a modern battlefield, the rate of exchange will be a bitter one. Some partial answers lie "in-house." For example, aerial observers could be taught to report the location and nature of targets without loitering to adjust artillery. Fire-for-effect missions, combined with moving on to greener (and safer) pastures, would increase the number of targets attacked.

On the other hand, the need for improved crater analysis techniques applies to the combat arms at least as much as it does to the field artillery. This is one area where improvement does not require a lot of expensive hardware. Abstracts of firing tables for enemy weapons, when used in conjunction with the measured angle of fall, would facilitate estimation of ranges to the enemy artillery. Curvature templates could be made out of plastic and distributed to both maneuver and artillery units. Because shell fragments frequently are distorted during the projectile's detonation, each forward observer, platoon leader and company-level commander should be furnished a template for gas check bands and rotating band seats. To any who would object that the maneuver units should not delay their operations for secondary considerations, the only thing worse than conventional "incoming" is not detecting the presence of an enemy unit registering its guns in preparation for a nuclear mission.

Proper delivery of US nuclear fire presupposes that the firing unit survived the initial enemy attack, moved to within range of the target and had reliable communications with which to receive both nuclear release and fire mission data. Competent, imaginative field artillerymen can partially ensure these conditions. The division commander, however, should be concerned about several areas. For example, although our present system of controlling nuclear weapons has served well in the past, potential enemies may learn to delay or disrupt its unique combination of positive control and responsiveness. In addition to a searching examination of the control system, the commander might emphasize faster and simpler means for developing and analyzing nuclear targets. Prompt warning orders and "ball park" figures are more valuable than detailed analyses of incomplete or changing data. Techniques should be reoriented to provide the commander with a reasonably accurate body of information upon which he can make a prompt decision. Target analysis would continue until expenditure of the weapon or cancellation of the mission. The commander would be notified at any point that new information indicated a conflict with command criteria for troop safety, damage preclusion, effect on target and so forth. A final example of an area worthy of the commander's attention is division

artillery/division communications. Tactical control and technical supervision require communications that are reliable and not likely to result in the unit's detection/destruction by the enemy. The effects of nuclear bursts and enemy electronic warfare dictate increased reliance on wire and messenger. Radio silence should be common and net discipline the rule. At relatively low cost, tape recorders could enable high-speed transmission/reception of lengthy material and would interfere with the enemy's direction-finding efforts. Extensive use of remote equipment would decrease the effectiveness of the enemy's fires on those units he did locate. Standardization of a semidirectional antenna, combined with an increased use of retransmission equipment, would allow relatively secure operation on low power. No detection would mean no jamming. In any case, US units would have a high-power reserve with which to overcome enemy interference.

The division artillery can support the division against the aggressor, but the support, like the division and the army, will be austere. The lavish days of Vietnam are past. Direct support to the maneuver units will depend on modest increases in quality and quantity of critical items, improved fire coordination techniques and realistic training during

peacetime. The nuclear superiority tasks will require improved communications and target acquisition capabilities and practices. Again, low cost "software" improvements will best fit the constraints of cost-effectiveness and frozen budgets. Combat arms leaders at all echelons must voice their thoughts and requirements. Only in this way can field artillery doctrine and techniques adapt and keep pace with the growth of new tactics for the maneuver units. Above all, the division commander, with the aid of his division artillery commander, will have to make difficult decisions that will be based on incomplete data, the conflicting demands of support for the maneuver units and nuclear fire superiority.

Some of the geographical names in *Webster's* are more prominent on battle streamers than on the map. But many more remain exotic and relatively unknown. Among them may be the battlefields of the last half of the decade. They are a quiet reminder that only a truly combined arms team can successfully travel the difficult path from Aachen to Zwolle.



CPT Peter M. Ossorio, FA, is serving with the 1st Battalion, 5th Field Artillery, Fort Riley, KS.

(continued from page 6)

to provide close support to maneuver and, of course, very frequently we may find a split priority with a certain percentage of fires allocated to one or the other mission. The ability to respond quickly to shifting priorities, to mass fires where needed and to provide special fires such as air defense suppression are all enhanced by this focussing of control of the guns at the division artillery level.

Detailed information on counterfire is included in the article in this issue and in the draft Training Circular 6-20-4 which was distributed the first of October — again I invite your attention to them. This revision to doctrine will merit your full support, especially until such time as the target acquisition battery can be made available to division artilleries.

Let me be more specific about the new target acquisition batteries. The commanding general of FORSCOM supports our counterfire concept and has approved the organization and attachment of three target acquisition batteries to CONUS division artilleries to be designated. This will be accomplished sometime this spring under the old TOE, 6-577G. In October, I recommended to the CINCUSAREUR, General Blanchard, that they do the same with the target acquisition assets currently assigned to the corps artilleries in Europe. This recommendation has since been favorably considered.

In addition we expect that a new TOE (6-307H) will be approved and implemented next June. This new TOE vastly increases the target acquisition capability of the current TA battery with 14 less people! As an example, the new battery will have two sound and flash platoons capable of covering 20

kilometers as opposed to the 10-kilometer coverage of the old battery. The DS battalion Q4-A radars will be assigned to the target acquisition battery but will normally be placed under the operational control of the battalion for operations. As indicated in the counterfire article, the TA battery processing section will become the targeting element in the Division Artillery TOC. I might add that the new TOE has been designed so that the units can readily accept new equipment as it enters the inventory, such as the TPQ-36 and -37 radars.

We will also maintain a TA battery at Fort Sill for test purposes, support of resident instruction and training of FA units on post, since it can act as the "enemy."

It is also of interest that we have the necessary personnel authorizations to expand our TA capability. In fact, with judicious assignment of TA personnel we can man a target acquisition battery with each division and increase tenfold the Army's target acquisition capability. In other words, tomorrow's TA capability can be achieved with the people we are authorized today.

As you can well imagine, we are very excited about this major evolution in field artillery doctrine and tactics. I believe that we have finally given the division artillery commander the necessary assets to do his job.

As always, your comments and suggestions are welcomed and encouraged. The viability of the resulting evolution of FA doctrine, tactics and techniques will be directly proportional to the extent to which Redlegs at every level actively involve themselves in its development.

COUNTERFIRE!

The knowledge that enemy artillery will outnumber ours as much as four to one on tomorrow's battlefield leads one to the conclusion that suppression and countersuppression of his artillery may well be the determining factor deciding the outcome.

With this in mind, USAFAS has examined our existing doctrine, organizations and procedures for counterbattery fires or, to coin a new term, COUNTERFIRE. As a result of this effort, new doctrine has been written in the form of a training circular, 6-20-4, Counterfire, which establishes effective procedures for its implementation. In addition, a plan for the reorganization and modernization of current target acquisition organizations has been developed.

To assist in the promulgation of this new doctrine to our readers, we have selected extracts from the new training circular and various briefings concerning counterfire. Your attention is also invited to General Ott's "Forward Observations" in this issue which also addresses this subject.—Ed.

Present doctrine, now being altered establishes corps artillery as the responsible headquarters for the counterbattery function of the corps. One can recall that the corps frontages in WWII were from 25 to 40 kilometers. There were exceptions to these figures but as a rule they are pretty close. Because frontages were as small as they were, corps artillery weapons could range the corps with little difficulty. Of course this has changed today; the factors which drove the equation then are no longer the same. Today our army is of course much smaller; by necessity we have undergone a modernization program of our weapons system but, in short, we are forced to do a lot more with a lot less.

To optimize the minimum forces we have today for maximum efficiency, the counterbattery function has been moved to *the division*.

Today's typical corps will find itself faced with frontages of 80 to 110 kilometers or more. It is difficult to visualize how effective communication will be at those distances — especially FM communication. The amount of information on targets alone would tax our systems to their limit. In 1994 we had a 5 to 1 advantage over the Germans and targets were scarce. Today we expect four enemy divisions to oppose one US division. Targets are going to be plentiful. Multiply those targets opposing a division by 2, 3 or even 5 and the number of targets at the corps level would be totally unmanageable.

Another factor which has changed are the weapons themselves. With the exception of the 175 gun, which is on its way out, and the Lance Missile, corps artillery

PART ONE

weapons today are essentially the same as those of the division. Whereas WWII corps artillery weapons could range most of the corps because of small frontages, today's weapons can hardly range a division.

There is yet another factor in the existing system which should be surfaced now. Currently, corps artillery manages the counterbattery effort and division artillery manages the maneuver support. With our artillery outnumbered and facing sizeable and sophisticated enemy target acquisition means, the questions of when, where, how and at what to fire must be decided quickly. Whether to suppress the enemy's artillery or support the maneuver elements must be decided at the same level.

Many alternatives have been examined. We've looked at the establishment of counterfire centers under corps artillery in each division zone. Consideration has been given to assigning the counterfire mission to field artillery groups. Both of these alternatives would require a considerable addition of manpower and communication equipment and the mission would still be separated from the commander who manages the maneuver support. Another alternative is to give the counterfire mission to the direct support (DS) battalion. This course of action was rejected for the reason that the DS battalion must be free to support the maneuver elements.

With the new mission of counterfire, the div arty commander will also be given the assets to do the job. Additional artillery to perform the counterfire mission is required. The doctrine developed in the training circular (6-20-4) reflects that corps artillery cannon battalions or groups would habitually be attached to division or given the mission of reinforcing division artillery. The div arty commander will have the authority to position his artillery to execute the counterfire mission as well as supporting the maneuver elements.



This article also spells out procedures for target production and the attack of those targets by div arty. A div arty TOC is established which integrates all S2/S3 functions; the S2 is no longer a separate element. Considerable emphasis has been placed on intelligence from all sources. These sources include the combat intelligence company, national and strategic sources, ASA, the US Air Force and the maneuver units.

We stress the necessity for FSE personnel at the division main CP to be thoroughly familiar with the capabilities of these sources and to be able to define our needs for targeting information in their terms. The idea of Redlegs bearding these sophisticated intelligence collectors in their respective dens is as novel as it is productive.

The div arty TOC is the focal point for this information which is correlated and refined by a newly established target-production element. The fire direction center and the operation element continue to provide the close and continuous support to the maneuver units.

There is yet another major area which reached its zenith in WWII and remains today a part of the corps artillery. This is the field artillery target acquisition battalion. Current doctrine calls for corps to assign missions to this battalion, placing the battalion in general support of the corps or its batteries in direct support of division artilleries. Because of today's frontages, the battalion would have a most difficult time controlling the activities of its batteries. Since the batteries work with division on a sometimes basis, no association or working relationship is established.

No need is seen for the headquarters element of the target acquisition battalion, and it is proposed that the spaces be used to form another target acquisition battery and the batteries be made a part of each division artillery.

The Div Arty TOC

To execute the new mission of counterfire, div arty commanders initially must provisionally establish a div arty TOC until the target acquisition battery becomes organic and TOE changes can be effected. The div arty TOC consists of target production, fire control and operation elements. These elements integrate all present S2/S3 functions, manage organic target acquisition assets, link with all sources of intelligence and manage the counterfire effort.

The div arty TOC may initiate counterfire either in response to a request for "immediate counterfire" or against lucrative/fleeting counterfire targets of opportunity. It may also initiate planned counterfire programs to suppress or destroy the enemy's artillery at the critical time and place.

Immediate Counterfire

Any unit receiving incoming artillery, mortar and/or rocket fire can request immediate counterfire from the field artillery. Requests should include:

| | |
|------------------------------------|---|
| <i>Identification</i> | <i>72B56 THIS IS X2F7</i> |
| <i>Warning order</i> | <i>IMMEDIATE COUNTERFIRE</i> |
| <i>Type of Fire</i> | <i>HEAVY MORTARS</i> |
| <i>Direction of source of fire</i> | <i>FROM NORTHWEST</i> |
| <i>Severity of fire</i> | <i>RECEIVED 10-20 ROUNDS AND STILL UNDER FIRE</i> |
| <i>Area Shelled (Grid)</i> | <i>AB147638</i> |

Maneuver and artillery units request counterfire through normal fire support/fire direction channels. Other combat support and combat service support units supporting maneuver units can request counterfire through the FSCCs of the maneuver units. Other support units can request counterfire through their command channels.

The request for counterfire is sent to the div arty TOC and should be encoded using authorized brevity codes or, if possible, be sent by secure voice equipment to prevent the enemy from learning the effectiveness of his fires.

The div arty TOC will immediately respond to the counterfire request with fires, based on guidance from the division commander concerning:

- priority of fires.

- ammunition constraints and
- survivability of our artillery.

Simultaneously, div arty may also request jamming and USAF close air support, as appropriate, through the fire support element at division.

Depending on guidance of the division commander, the div arty commander may declare a *restricted counterfire* posture. Under such conditions the decision to respond to requests for counterfire rests with the div arty commander who may delegate his authority to the div arty TOC with guidance concerning ammunition expenditures for counterfire, levels of damage (suppress vs destroy) or severity of the situation.

The DS battalion may, unless otherwise restricted, immediately initiate counterfire using its organic weapons or its reinforcing artillery in response to a request as it passes the request to the div arty TOC. When the DS battalion FDC passes a request to the div arty TOC, the FDC states what action it is taking and recommends what action div arty should initiate. This would depend on the demands for close support fires and division policy. The div arty TOC will pass targets to DS battalions, but it is not intended that the DS battalions will become extensively involved in target processing.

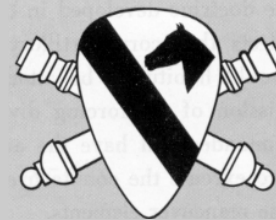
Counterfire Programs

Based on guidance from the division commander, the division artillery commander may initiate counterfire programs against all or part of the enemy's indirect fire system. When such programs are fired, priority of fire

The "Red Team" Tests Counterfire

Last spring, the division artillery commander and his staff began to work closely with personnel of the Target Acquisition Department on the Counterfire Training Circular. Using the past year of training to draw on, they were able to aid in evaluating the concepts outlined in the training circular and views and ideas from a field unit. After reviewing several draft editions of the TC, the TAD director wanted to field test the ideas using a TOE unit. The Red Team was fortunate in that it was able to assist TAD, serving as the players during the exercise.

After one day of classes for the soldiers, the div arty staff moved to the field and began operating as a division artillery tactical operations center (TOC). The div arty TOC was manned just as outlined in the draft TC — utilizing the officers and men from the S2, S3 and target acquisition platoon to fill the required slots. During the first day, the procedures as outlined in the TC were followed to the letter. The scenario contained about 2,000

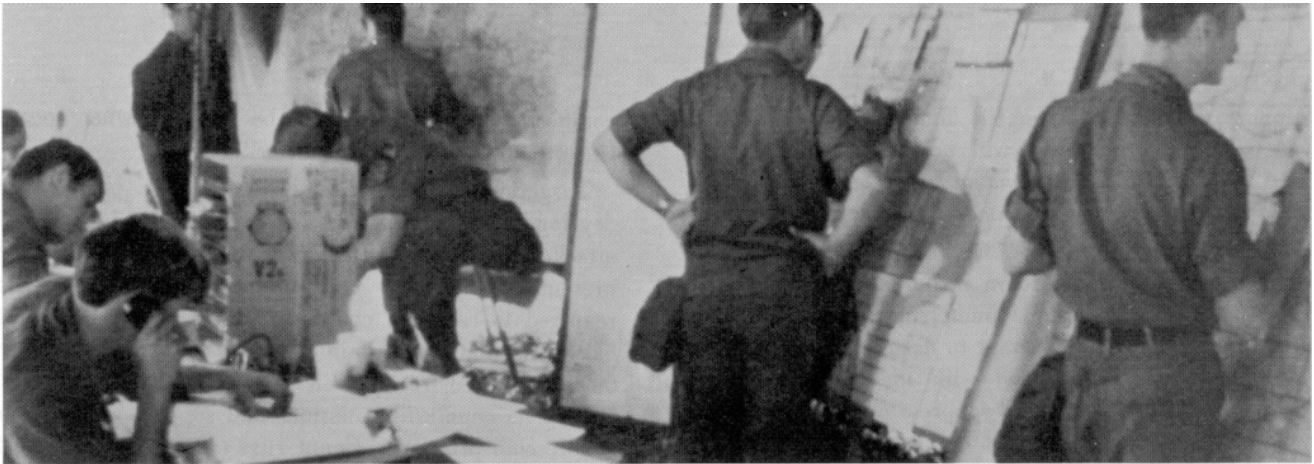


messages exercising every facet of a div arty TOC.

After 12 hours of problem play, an eight-hour break was called, and the controllers and players discussed the day's activities. As the players were able to relax from the challenging but hectic pace of the problem, they expressed concern over the paucity of personnel in the shift and each man was certain he needed assistance.

Slight modifications were made to the internal operations including a somewhat different filing system, an overlay for two of the maps and a teletype TT-98 which was remoted into the TOC to assist in passing the large volume of information to higher and lower headquarters. This proved to be a great idea.

Bright and early the next day, the message play began again. The practical experience received the first day enabled the men to keep pace with the messages, and



Redlegs of the 1st Cavalry Division Artillery testing the div arty TOC concept at Fort Hood.

may be to counterfire and a considerable portion of our available artillery assets would engage counterfire targets. Brigade commanders may also request the div arty TOC to initiate counterfire programs. The allocation of artillery resources for counterfire programs represents the employment of a sizeable amount of the division's combat power and will be an important *command* decision.

Counterfire programs are appropriate in the following situations. In the offense: As part of a preparation preceding a brigade or division coordinated attack, suppression programs would be fired on the enemy's indirect fire system and then fires would shift to attacking and weakening enemy frontline defenses; during the conduct of the attack when the enemy's indirect fires are


prohibiting mission accomplishment or causing unacceptable damage/casualties, countersuppression programs can be fired on the enemy's guns; and during the consolidation of an objective, to prevent the enemy from executing a counterattack, counterpreparation fires can be fired and countersuppression of the enemy's fire support means would be the first phase of the counterprep.

In the defense: When an enemy attack is imminent, counterpreparation fires can be executed and countersuppression programs as noted above can be fired; when the enemy initiates a barrage prior to an attack or during an enemy attack when indirect fires are significantly reducing the effectiveness of our direct fire means, countersuppression programs should be fired.

By firing suppression and countersuppression programs, we keep the enemy's guns off our antitank systems and our guns so the artillery can continue to

they began to operate as an efficient team. The soldiers' reaction to the exercise was overwhelming. The nature of duties assigned to each individual and the amount of activity taking place required each soldier to perform a vital function. No one served as just an RTO. Each was required to make decisions, such as units to engage targets, ammunition to fire, unit movement and what constituted a viable target. They were able to learn not only the new tasks during the two-day exercise, but also, by the end of the second 12-hour shift, how to function as a team. During the critique of the second shift, it was found that, by adding one officer to the proposed TOC organization, the number of people required to operate was more than sufficient.

One of the great benefits was the renewed demonstration of just how well American soldiers perform. They have initiative and innovation, responding to good training. During the month of September 1975, the Red Team again used the div arty TOC concept. Utilizing new people in several key positions, the results obtained were impressive.

The concept was tested during 24-hour operations, and the div arty TOC was relocated. The results were again totally positive. Utilizing the procedures as outlined in the soon-to-be-published TC, one-third of the enemy's artillery was destroyed and one-third was damaged. Shifting operations from the main TOC to the Jump TOC by flying personnel and overlays to the new TOC went smoothly, and continuous operations were maintained. Participants feel the concepts and procedures as outlined in the training circular are extremely sound and, more important, they work. We in the Red Team have begun to reorganize internally as suggested in the TC. We are consolidating radars for maintenance and training. We feel that corps artillery would be too far removed from the battlefield and that the division artillery must be able to silence the enemy's artillery. After utilizing the procedures in the TC on two exercises, we feel division artillery must be the headquarters which has the counterfire responsibility. 

CPT Bob Chambliss, Battery Commander, HHB, 2d Bn, 19th Field Artillery, 1st Cavalry Division.

support the battle. When the fight at the FEBA gets intense, priority of fires will normally switch to that area. *The division commander decides the priorities of fire, and the div arty commander executes counterfire and/or close support fires accordingly.*

In directing counterfire in response to an immediate request or as suppression/countersuppression programs, the div arty TOC will attempt to destroy or suppress the enemy personnel associated with the enemy's indirect fire system. The decision to suppress or destroy depends on the number of targets to be fired, ammunition and fire units available and guidance from the div arty commander. If possible, we will always attempt to destroy the enemy.

Counterfire Targets

Counterfire targets developed by the div arty TOC are engaged immediately or planned for attack later on the basis of the division commander's guidance (based on the mission and how he plans to fight the battle) and the div arty TOC evaluation of the situation. In a fluid situation (enemy artillery moves frequently), we may attack counterfire targets when located or delay slightly to attack with TOT massed fire. In a static situation attack (depending on assets available), we may want to develop suppression/countersuppression programs.

The importance of the target is also a determinant. If the target can directly affect our operation (e.g., a 122-mm battery), shoot now (or delay and attack with TOT massed fires). If the target is giving us useful information (e.g., regimental data link), plan for attack later. The target's importance to the enemy is also significant. If the target is necessary to the command and control of the enemy (e.g., regimental COP), plan to attack at a critical point in the battle.

The stay time of the target may influence our thinking, e.g., how long has the target been in position, when did we locate it and how long does it normally stay? If we expect the target to move soon, attack now (or delay slightly and attack with TOT massed fires).

Fire support and ammunition available are always important considerations. If fire support means are available, attack now (or delay and attack with TOT massed fires). If additional means will shortly become available, plan for attack. If, however, assets and ammunition will remain scarce (restricted counterfire), plan to attack at a critical time (countersuppression).

Some specific examples of targets which should be engaged immediately are: mortars located by Q-4A radars should be attacked by the DS battalion receiving the radar grid; multiple rocket launchers should be attacked when

located because of their mobility; and counterbattery radars should be attacked when located since they provide no useful intelligence.

Targeting is done in the div arty TOC primarily to develop counterfire targets. Those targets not immediately attacked are sent to all artillery units within range from presently or planned positions. DS battalions are not required to establish counterfire targeting elements. DS battalions should maintain current lists of the counterfire targets received from the div arty TOC to facilitate firing immediate counterfire missions and suppression/countersuppression programs. Counterfire targets located by DS battalion assets, e.g., FOs and Q-4A radars, can be attacked by the DS battalion or passed to the div arty TOC for attack or fire planning, depending on current demands for close support artillery fires and the div arty commander's guidance. If the DS battalion attacks a counterfire target, the div arty TOC is so notified.

The div arty TOC will continue to perform its present maneuver support role responding to requests for fire from DS battalions, the fire support element and from adjacent divisions. General targets developed by the brigades, the div arty TOC or intelligence sources are passed to the FSE. If these targets are critical to the overall operation, the G3 may direct the FSE to coordinate an attack with division fire support means. The FSE would pass the targets to the div arty TOC as a fire mission, and the div arty TOC may mass the division artillery on them and request additional fires from adjacent artillery units as appropriate. If these targets are critical only to a brigade, they are attacked by DS and reinforcing artillery battalions as directed by the brigade commander and additional fire support may be requested from the div arty TOC. The div arty TOC can request the FSE to augment their fires with tactical air, naval gunfire and electronic warfare support as necessary.

The div arty TOC, by combining the previous operational functions of the div arty S2 and S3 under the single management of the S3, will be able to assume the new major function of controlling counterfire. Div arty commanders can establish provisional div arty TOCs as described in this article until the improved target acquisition battery becomes organic to div arty, at which time sufficient assets will be provided to man the div arty TOC. Action is currently in progress to reorganize existing target acquisition batteries and to activate sufficient new batteries to provide each active division with a target acquisition battery. Each target acquisition battery (present and proposed) has a seven-man processing section which consists of one officer, two NCOs and four enlisted personnel to provide the nucleus for the TOC's targeting element.

The div arty TOC performs three essential tasks;

targeting, controlling counterfire and other target engagement and advising the div arty commander.

Targeting includes:

- Producing counterfire targets by merging data from all intelligence and target acquisition sources available.
- Predicting counterfire targets by maintaining enemy indirect fire order of battle data.
- Cuing target acquisition and intelligence agencies to locate counterfire targets.
- Passing self-generated noncounterfire targets to the FSE and brigades.
- Passing intelligence to brigade and division intelligence staffs.

Controlling counterfire and other target engagement consists of:

- Responding to requests for "immediate counterfire."
- Engaging self-generated counterfire targets.
- Developing counterfire programs for suppression and countersuppression as required.
- Responding to other targets requested by the FSE and brigades.
- Coordinating the counterfire efforts of the ASA jamming unit, target acquisition system, battalion FDCs and division FSE.
- Directing or requesting that damage assessments be performed to determine the effectiveness of counterfire efforts.

Advice to the division artillery commander consists of:

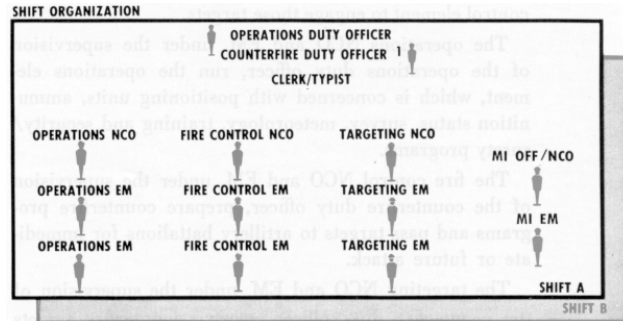
- Recommended artillery organization for combat.
- Recommended positions for artillery units.
- Recommended priorities of artillery fire during surge periods.

The FSE also performs these functions but is oriented more toward fire support coordination than to counterfire. The div arty commander (FSCoord) considers recommendations from both the FSE and the div arty TOC along with the number and location of enemy maneuver and indirect fire units before advising the division commander on how the artillery can best support operations. The division commander is the final decision maker on the allocation of artillery assets to support his battle plan.

The div arty TOC will establish the close working relationships between targeting, intelligence and fire control personnel of the div arty that are needed to effectively locate and attack enemy indirect fire systems. Physically collocating targeting and tactical fire direction personnel will increase the effectiveness of fire direction personnel by giving them confidence in the targets they attack; this closeness will develop *esprit* in targeting personnel by letting them "see" the targets they developed being engaged. Mutual trust and understanding creates the team work that will allow us to more effectively engage

more counterfire targets than ever before and thereby improve the division's balance of combat power. The div arty TOC is organized as shown:

DIV ARTY S3 ASSISTANT S3—PLANS



It is noted that this organization includes personnel from a target acquisition battery processing section (one counterfire officer and six targeting element personnel). Until they are available, div arty commanders should form provisional div arty TOCs by assigning one additional FA officer as counterfire officer and using enlisted personnel in MOS 13E, 17, 96B and 96D who are most qualified to fill the targeting positions.

The MI officer and NCO must be provided by div arty TOE changes. In the interim, MI personnel should be requested from the division combat intelligence company (one MI EM per shift is not currently supported by the old BICC concept; however, field testing has shown the need for additional personnel and action is under way to increase the size of the div arty MI augmentation from two to four personnel).

The div arty TOC can be manned continuously with two 12-hour shifts.

Targeting and fire control personnel *must work side by side* to be most effective.

Duties of TOC Personnel

The div arty S3 is the officer in charge of the TOC. In addition to his traditional duties, he establishes the SOP for the div arty TOC and is responsible for its operation to the div arty commander.

The assistant S3-plans is responsible to the S3 for planning all operations. He is concerned with types and amounts of artillery necessary for future operations, future organizations for combat and ammunition required supply rate (RSR).

The operations duty officer is the div arty TOC shift leader, responsible to the S3 for the overall operation of the TOC during his shift. He provides guidance on current

operations to the counterfire duty officer and operations duty NCO.

The counterfire duty officer is responsible for and supervises the fire control and targeting element. He directs the efforts of the MI augmentation and targeting element to produce targets and the efforts of the fire control element to engage those targets.

The operations NCO and EM, under the supervision of the operations duty officer, run the operations element, which is concerned with positioning units, ammunition status, survey, meteorology, training and security/surety programs.

The fire control NCO and EM, under the supervision of the counterfire duty officer, prepare counterfire programs and pass targets to artillery battalions for immediate or future attack.

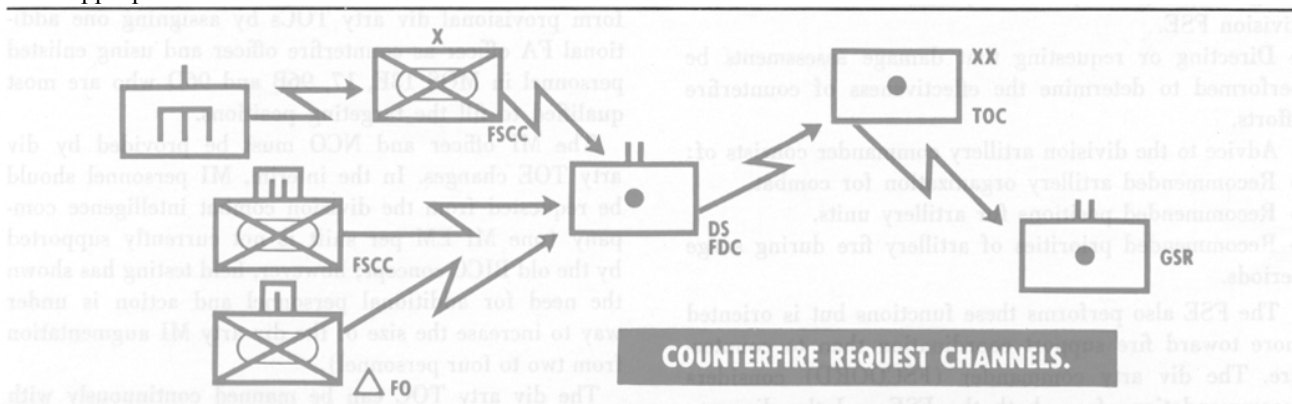
The targeting NCO and EM, under the supervision of the counterfire duty officer, receive counterfire targets and target indicators, produce counterfire and other targets, follow those targets to attack and pass intelligence to the appropriate maneuver staff.

the battalion.

The battalion should establish procedures to rapidly forward the following types of counterfire information to the div arty TOC: locations of enemy indirect fire weapons and COPs; counterfire damage assessments; activity near enemy weapon sites and COPs; and counterfire target indicators (including data derived from hostile indirect fire), which can be used to cue other intelligence agencies.

Anyone observing enemy indirect fire that is causing little or no damage will report it to the div arty TOC through the most accessible FO or FSO/FSCC. For those personnel to whom an FO or FSO is not accessible, the report will be sent through their normal command channels. Reports should follow the standard SHELLREP format but any report that tells "who, what, when and where" is acceptable.

The target acquisition battery, to be organic to the division, will be managed by the div arty TOC. It collects intelligence data from organic division assets.



The MI augmentation personnel maintain intelligence data, with primary emphasis on the enemy indirect fire order of battle, to facilitate target prediction.

The Target Acquisition Battery

The target acquisition battery reports the following counterfire information directly to the div arty TOC: enemy indirect fire weapon locations; movements on or near enemy COPs, weapon positions and resupply points; counterfire damage assessments; and counterfire target indicators which can be used to cue other intelligence agencies. The target acquisition battery will generate much data not concerned with counterfire. Div arty TOC personnel must pass these data to other agencies that can use them. The artillery battalion operations/FDC collects intelligence data from FOs, aerial observers, crater analyses and AN/MPQ-4A radars organic or assigned to

Requesting Counterfire Information

Because intelligence reports tend to be both sporadic and fragmentary, div arty TOC personnel, the division artillery intelligence officer (AIO) with the FSE and target analysts, FSOs, FOs and all FSE and FSCC personnel must:

- Thoroughly understand the intelligence collection agencies available.
- Constantly pursue counterfire information. In this light educating collection agency personnel on the informational needs of an effective counterfire system will be a continuous, important step in this task.
- Develop indicators into counterfire targets by actively requesting additional data from any available source.
- Filter, refine and redirect counterfire information as directed by the div arty TOC — too much data merely

overloads targeting personnel and decreases the number of targets they can produce.

- Insure that all counterfire data are transmitted rapidly to the div arty TOC.

Specific counterfire information requirements of the div arty TOC depend on the situation and the information already available to the targeting section. The div arty TOC needs as much counterfire information as possible to develop targets, but too much inaccurate data simply overloads the processing system. If necessary, the duty officer may reject certain types of information (e.g., locations less accurate than 200 meters or outside the division zone of influence).

Additionally, much information acquired and developed by the div arty TOC for the attack of counterfire targets may be particularly valuable for decision-oriented intelligence purposes. Intelligence must flow both ways. Div arty TOC personnel must be alert to the intelligence requirements of the division G2 and maneuver S2s.

Data inputs can be further reduced if the AIO requests that both the Army Security Tactical Support Element (ATSE) located in the exclusion area of the division command post and the analysis and production section of the division G2 refine their counterfire targeting information to the designated accuracies. An example of target location accuracies the AIO may request is shown below:

| <u>Target</u> | <u>Location accuracy (radial error in meters)</u> |
|---|---|
| Communication jammers and radio direction finders | 0 to 150 |
| Counterbattery/countermortar and ground surveillance radars | 0 to 150 |
| Indirect fire units and fire control radio data links | 0 to 250 |

The above accuracies should be used only as guidelines by the div arty TOC. In actual situations, they should be adjusted as necessary to regulate the workload of the targeting section and to comply with the division commander's guidance on the most important counterfire targets. When the div arty TOC is forced to restrict its data input, collection agencies should save any rejected data and continue to refine it to the required accuracy or, on demand, report the best information available.

When more data are required to develop a specific counterfire target or to fill a void in a specific sector of the division zone, the div arty TOC will cue any agency capable of observing the designated target/area or reposition or reallocate its own target acquisition devices to view the area.

To request aerial reconnaissance/surveillance, the AIO

The concluding portion of Counterfire will include sections on target production, the attack of counterfire targets, counterfire communication and future trends.—Ed.

must give the division G2 reconnaissance and surveillance (R&S) section the following:

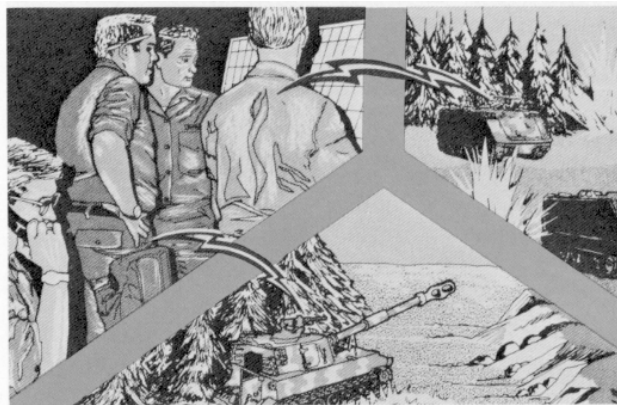
- The information requirement.
- The area to be searched.
- Any requirements for immediate (in-flight) information. (Except when air-ground data links are available, this is generally limited to information that can be gained from visual observation and radioed directly to the Tactical Air Control Party, TACP.)
- Other information required by division SOP.

Aircraft crew mission reports are usually available to the G2 R&S section 30 minutes after the aircraft lands. Other reports that involve more processing time and imagery interpretation take longer and must be specially requested. A "hot report" gives major targets from initial imagery interpretation and is available one hour after the aircraft lands.

FSE personnel may also request air reconnaissance from the G3 air and other agencies using close air support to take advantage of the visual or armed reconnaissance capability of tactical aircraft on return flights.

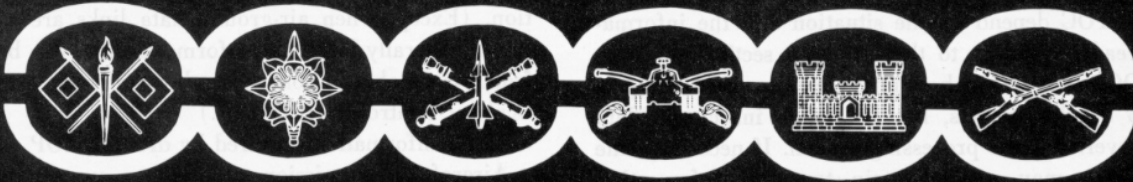
The AIO may request the division G2 section to allocate a team from the sensor platoon of the combat intelligence company to support the counterfire effort. This team will have sensors emplaced in the desired area and may monitor them from the div arty TOC.

All AN/MPQ-4A radars will be allocated by the div arty TOC across the front as dictated by command guidance, the terrain and the enemy situation. The using artillery battalion will site and operate the radar as its own. Because the radar is most effective against mortars and because reaction time is so short, the DS battalion itself will probably engage many of the counterfire targets developed by its radar. To reduce its vulnerabilities (it is an active electronic emitter) and increase its effectiveness, the radar should be oriented and cued only when enemy mortars are firing. The div arty TOC may direct any or all radars to reorient to different areas of the battlefield dependent on the situation.



Execution of counterfire.

with our comrades in arms



Hellfire!

Army combat soldiers from the Armor and Aviation Schools tried their marksmanship with laser guided missiles at Redstone Arsenal recently and struck stationary and moving targets which were completely hidden from their launch site by trees and terrain.

The tests demonstrated the pinpoint accuracy of Hellfire missiles launched from a helicopter in an indirect trajectory. The indirect firings completed all major objectives in advanced development to verify technical feasibility and are a prelude to an Army decision to initiate engineering development with the Hellfire program.

The Missile Command has demonstrated Hellfire's versatility and accuracy with rapid and ripple test firings and direct and indirect launches from the ground and helicopters. Particularly important, the last four firings featured user participation, highly unusual at this early stage of development. Normally, soldiers don't get their hands on new equipment until much later in the development cycle (during operational and development tests).

During one of the tests at MICOM's Test Area I, CPT



Kurt Rhodenhamel was pilot of the Cobra gunship carrying the missile which hit the moving target, and CWO Harry Barber was at the controls of the gunship launching the missile which hit the stationary target SGT Tim Hastings was the forward observer who marked the targets with a laser beam for both pilots. Hastings, equipped with a ground laser locator designator, acquired the targets more than a mile away and requested fire support as he would in a tactical situation. Barber and Rhodenhamel, during their respective missions, flew nap-of-the-earth maneuvers and moved to the firing site which was completely hidden by trees and terrain from the target location. Hovering about 25 feet off the ground, the pilots launched modified Hornet missiles carrying Army laser seekers. The missiles, launched at a seven-degree elevation, pitched up over the tree thicket to 1500 feet, locked on the laser energy reflected off the targets and flew straight to the spots illuminated on the targets. Operational communications were incorporated into both tests as Hastings called and directed fire on the targets using normal communication procedures in cooperation with blockhouse personnel.

Hellfire, being developed for launch from attack helicopters, provides the Army with a family of terminal homing-seeker modules and a common airframe to engage a variety of tank and hardpoint targets. It's the first antitank weapon being designed especially for helicopter launch.

Missile Minder Development

The AN/TSQ-73 (Missile Minder) has successfully completed the second phase of Developmental and Operational Testing. Following DT/OT II and IIA, the system was type classified Limited Procurement (LP) for the production of four systems (one initial production test model and three laboratory-configured trainers), The initial production test model will be used for DT/OT III while the trainers will be used by the Air Defense School for training operators and maintenance personnel.

With Our Comrades In Arms



Army technicians operate electronic console displays of the Missile Minder (TSQ-73) system.

The AN/TSQ-73 is an automatic data processing Air Defense Command and Control System programmed to replace the currently fielded AN/MSG-4 Fire Distribution System. The AN/TSQ-73 system, designed for use with Nike Hercules and Hawk units, will be fielded in both the battalion and the group level configurations. The basic AN/TSQ-73 consists of a general-purpose digital computer with two central processing units, input/output devices, two general purpose display consoles, radar interface and processing unit, communications interface units, simulation unit and a digital data display group. The track handling capacity of the Missile Minder will be more than twice that of its predecessor. Design goals for the system include better reliability and easier maintainability.

Like all systems under development, the program is under continuous evaluation, and additional testing will be conducted before full-scale production begins.

The Directorate of Combat Developments, USAADS, is the TRADOC representative for system development. The program is managed by the Project Manager, Army Tactical Data Systems, FT Monmouth, NJ. (*Air Defense Trends*, May-June 1975)

Sam-D

The Army said SAM-D would work and then proved it.

With the intercept of a low-flying pilotless drone at White Sands Missile Range, NM, the Army's new air defense missile recently met the last of the major test criteria ordered by the Department of Defense in 1974 to

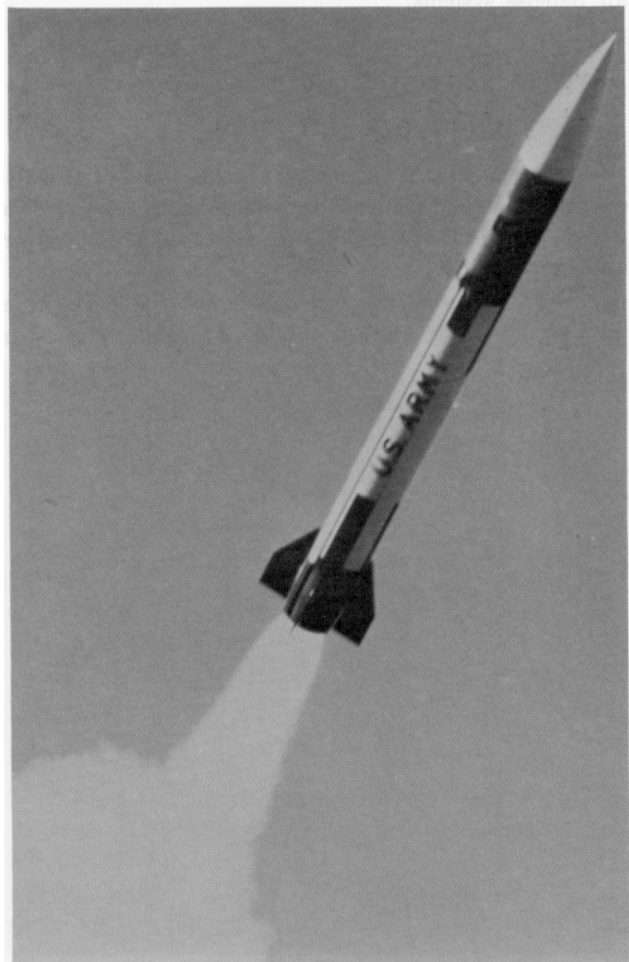
demonstrate SAM-D's track-via-missile (TVM) guidance concept.

"We've done everything DOD asked us to do. We've accomplished all the major test objectives established for the 16-missile proof-of-principle flight test program," said MG Charles F. Means, SAM-D project manager at Redstone Arsenal, AL.

Next comes decision time. The Defense Systems Acquisition Review Council will review the SAM-D program and, in January, decide whether SAM-D is ready to move into full-scale engineering development.

Describing the proof-of-principle flight test program thus far as ". . . near perfect, one in which the Army encountered no major technical problems . . .," Means added, "We're confident of a favorable decision."

The assigned SAM-D test objectives were accomplished during the first six firings of the scheduled 16. The DOD criteria called for SAM-D intercepts against a non-maneuvering and a maneuvering target, a target flying in formation and a target at low altitude in ground clutter.



With Our Comrades In Arms

"We couldn't be prouder of SAM-D accomplishments," Means said. "The program success was made possible by a great team of dedicated people."

During the remainder of the test program, the Army will continue to fire SAM-D against a variety of high-speed, high-altitude long-range targets, low-altitude formations and maneuvering targets.

"We plan to continue the firing until we complete the 16-missile program," Means said. "Our goal however, is not to fire fast—but to do it right."

The key to SAM-D's TVM guidance is the fire control group which features a phased array radar and digital computer. In operation, the radar acquires the target and tracks and illuminates it; at the same time the radar tracks the missile into its mid-course flight path. Then, during the terminal mode, the missile acquires the illuminated target and, aided by the ground based computer, tracks on that illumination until intercept.

The mobile, all-weather SAM-D will provide the Army a substantial increase in air defense against multiple and maneuvering targets in an electronic countermeasures environment, replacing both Nike Hercules and Hawk air defense systems.

Army Develops Wheel-Track Vehicle

US Army Tank-Automotive Command (TACOM) engineers have developed and successfully operated a unique vehicle that can be used either as a wheeled or a tracked vehicle.

Called the wheel-track convertible test rig, the vehicle is a high-mobility tactical vehicle designed to carry a



3/4-ton cargo. The rig weighs 5,600 pounds (6,700 pounds with tracks installed) and is equipped with eight gear-driven wheels. It can travel over paved roads at a speed of 55 miles per hour. With tracks installed it "crawls" cross-country at speeds up to 35 miles per hour.

To convert the vehicle from wheels to tracks, four band tracks are installed. Each fits snugly around two of the vehicle's tires. Three men can convert the rig from wheels to tracks in less than one hour. When installed, the tracks enable the vehicle to traverse soft soil and snow.

The rig is currently undergoing tests and modification at TACOM. It will then be subjected to troop evaluation. The wheel-track convertible test rig is still several years away from mass production and becoming a part of the Army's vehicle fleet.

New Knife-Bayonet

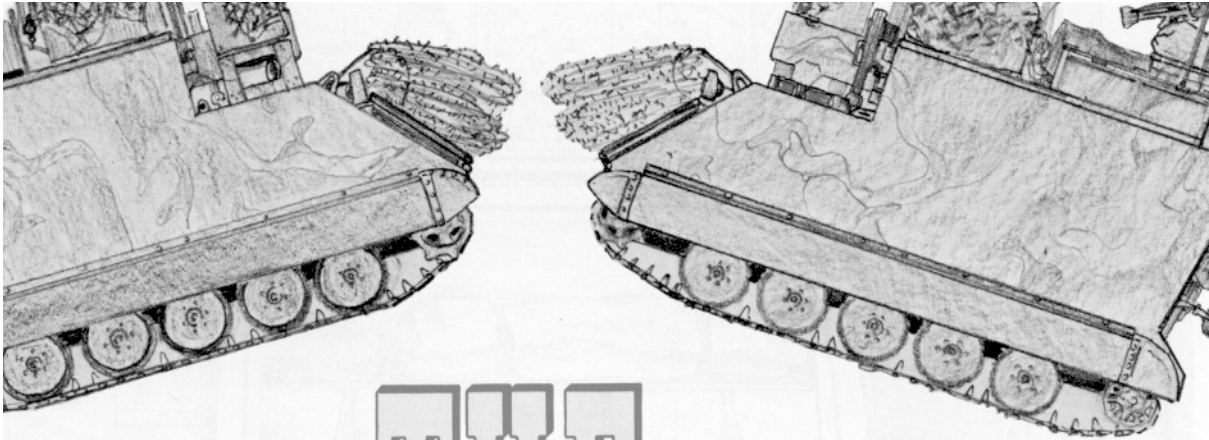


The Infantry School has requested development of a knife-bayonet to replace the current M7 Bayonet-Knife. The prototype shown here has a blade similar to that found on the Marine Corps' combat knife.

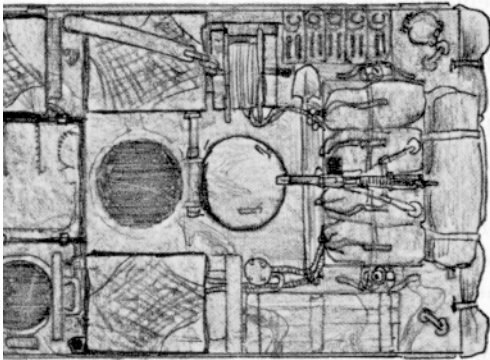
Feedback from the field indicates that such an item is needed for cutting brush (camouflage, fields of fire); opening containers (ammunition, rations, medical supplies); probing and digging; and for miscellaneous maintenance repairs and modifications.

The serrated upper edge has been added for crosscut work and for cutting plexiglass and thin aluminum sheet as may be required in survival situations. (*Infantry*, January-February 1975)

The wheel-track convertible vehicle developed at the US Army Tank-Automotive Command, Warren, MI, has been designed to operate in soft soil and snow as well as hard-surfaced roads. The test rig has eight gear-driven wheels and is controlled by skid-steering.

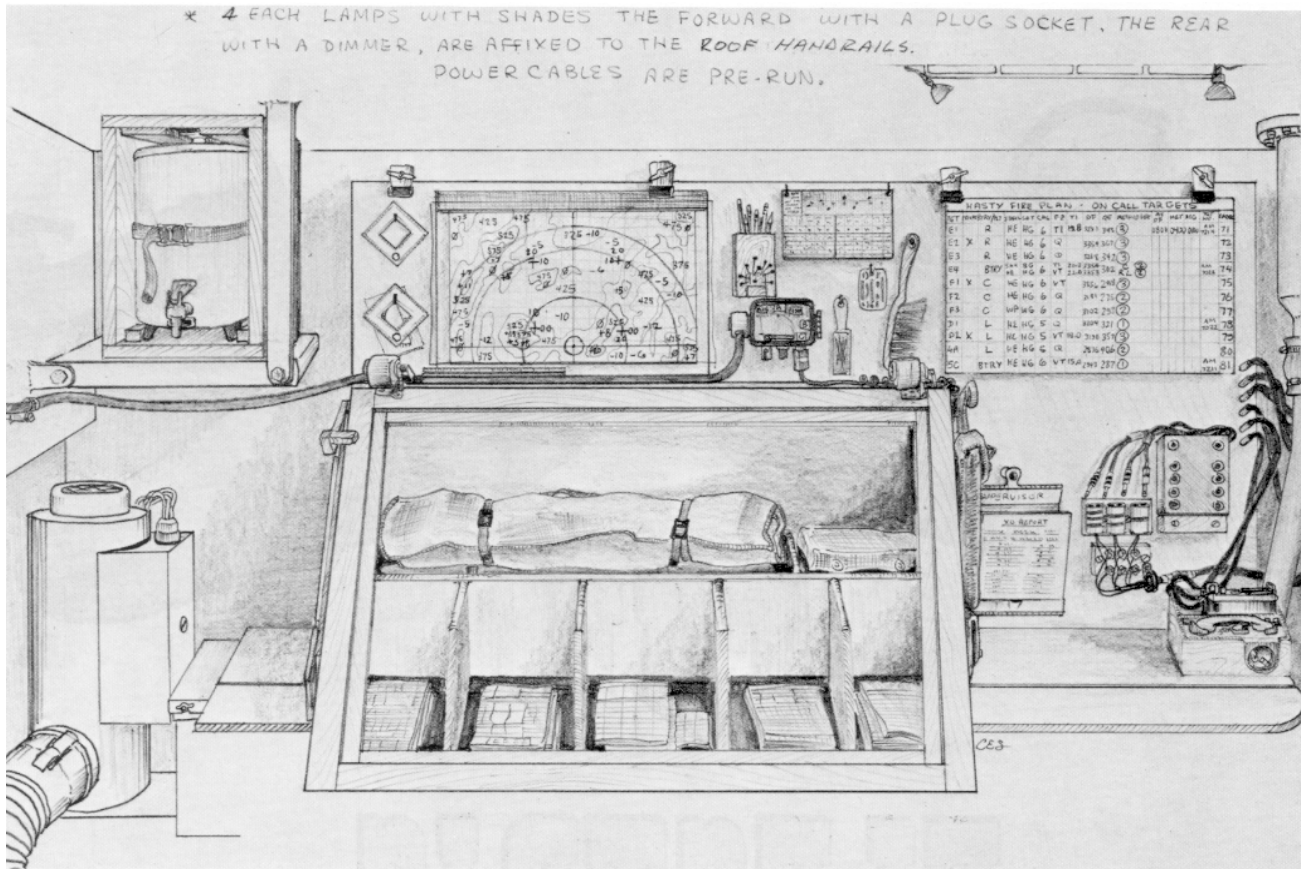


THE ELECTRIC COMPANY'S FDC

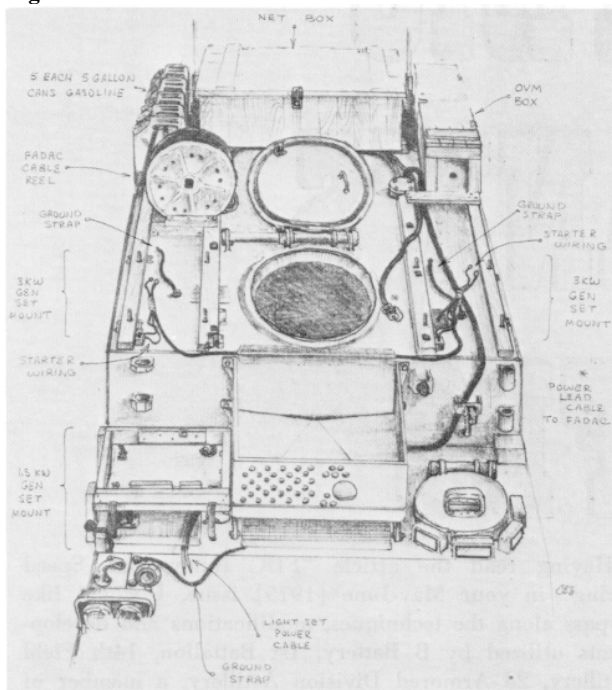


Having read the article "FDC Innovations Speed Firing" in your May-June [1975] issue, I would like to pass along the techniques, modifications and developments utilized by B Battery, 1st Battalion, 14th Field Artillery, 2d Armored Division Artillery, a member of "Brigade '75," located at Grafenwoehr, Germany.

by CPT Anthony N. Kuykendall

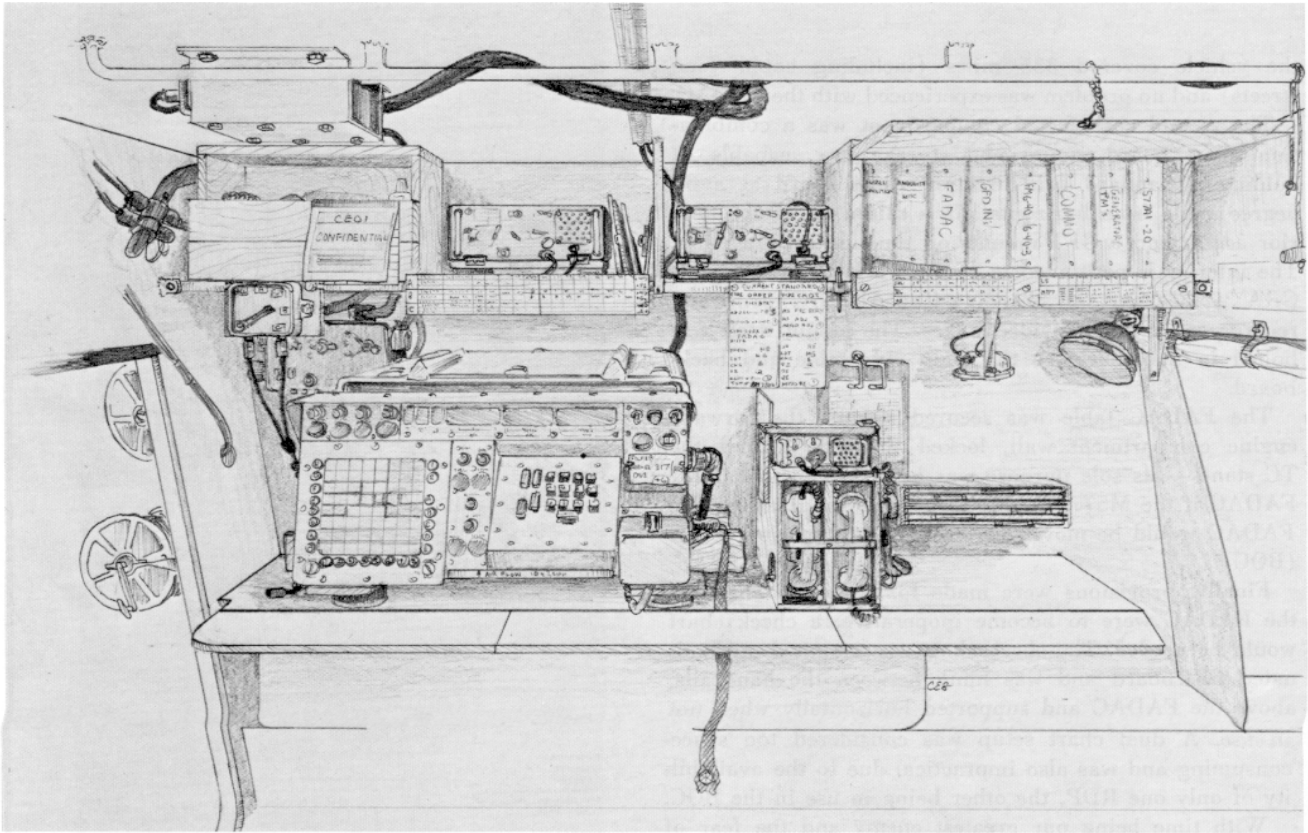


Right interior.



All the following equipment modifications, techniques and procedures were developed by LT Christopher E. Strauss, the Battery Assistant Executive Officer, and by SP4 Christopher L. Record, Chief Computer. All drawings are by the lieutenant.

Often referred to throughout the battalion as the "Electric Company," the M577A1 of Bravo Battery rolls out of the motor pool completely self-contained. The antenna matching units have been moved to the rear so that the antennas can remain erected and tied down to the rear, with a quick release by the track commander (TC) hatch. This facilitates moving in under trees or camouflage nets with minimum obstruction. Two 400-cycle generators, three kilowatt, are mounted on top of the track — the second, providing a backup and a means of servicing while continuing to fire utilizing FADAC. Five 5-gallon cans are mounted on the rear for ease of refueling, and each generator is modified with an electric starter (FSN 2920-00-882-3401), allowing the TC to start the generators by simply pushing a button as the track moves into position. Before the track has stopped moving, the circuit breaker on the generator is thrown to the ON position and the TC directs the FADAC operator to throw the circuit breaker on the FADAC. This is done only after the generator has reached the correct power setting. Meanwhile, the TC releases the radio antennas. As the track comes to a halt the FADAC operator turns on the FADAC. Within 20 seconds the computer is ready for computation, the driver is now in position and they are ready to shoot. The FDC personnel are never exposed. When the driver and TC move to their positions, they close the hatches. The rear ramp is never lowered. Additionally, there are section boxes mounted on top for an extra camouflage net and OVM. Up front (over the

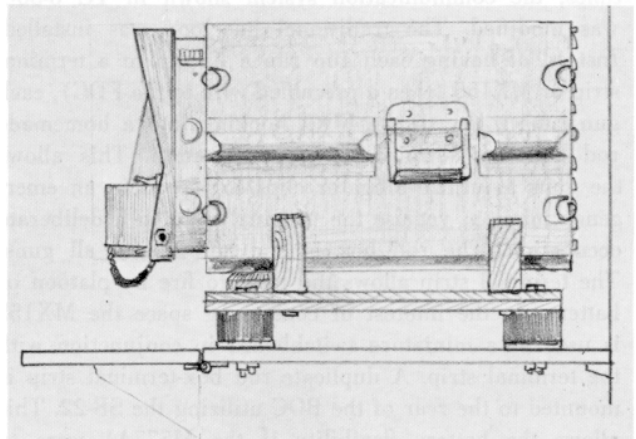


Left interior.

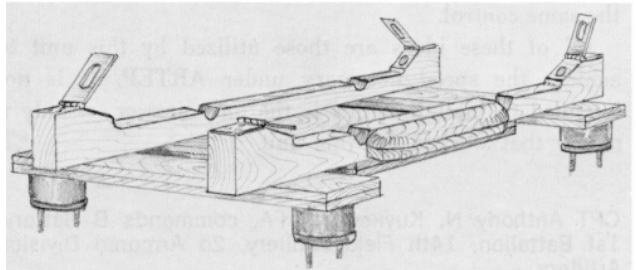
exhaust stack and protected by an asbestos layer) is a 1.5 kilowatt generator for a backup light power source should the 4.2 kilowatt generator become inoperative.

During deliberate occupations a camouflage net is carried forward by the advance party. Upon arrival of the main body, the M577A1 is driven under the net and the track is completely ready for immediate operation.

The first consideration in planning the interior was the installation of the FADAC. The only acceptable installation would incorporate a shock-absorbing system. This was achieved by constructing a wooden cradle to hold the FADAC securely in place. An unusual source provided the solution to the problem of a shock-absorbing mount for the FADAC. It was discovered that German 90-mm *kannon-jagpanzer* ammunition cannisters contained a large rubber shock pad (about four inches in diameter and two inches high) with a center hole and accompanying metal cup. (Note: eight 1955-1957 Chevrolet V8 motor mounts will suffice.) These were utilized to provide a four point shock-suspension system. In practice the FADAC was solidly mounted — difficult to flex in its mount. On the move, however, as much as an inch of flex was noted during rough travel, effectively absorbing the worst shocks of a tracked vehicle. The FADAC and cradle were mounted on the left side table, just forward of the AM 1780 VRC, with the uncovered back side an inch and a half from the side wall. A coarse fiber packing pad was placed between FADAC and the wall. This cut down on foreign matter entry and negated the possibility of an



FADAC Mount.



extremely large bump causing the FADAC to contact the wall. The overall height of the installation provides more than adequate ventilation underneath the cradle, and under the worst conditions overheating was not experienced. During the three months the mount was utilized,

the vehicle covered 335 miles (including cobblestone streets) and no problem was experienced with the FADAC.

The second constructed compartment was a combination chart board mount and storage box, capable of holding a standard fire direction chart board at a 30 degree angle from horizontal. It is raised easily for interior access and a GFT mounts on the side for traveling. The interior is petitioned to carry two RC 292s and two GRA 39 local sets, all in their cases. All FDC forms and records are kept in divided boxes. The mount itself was bolted in five places to the right side table and backboard.

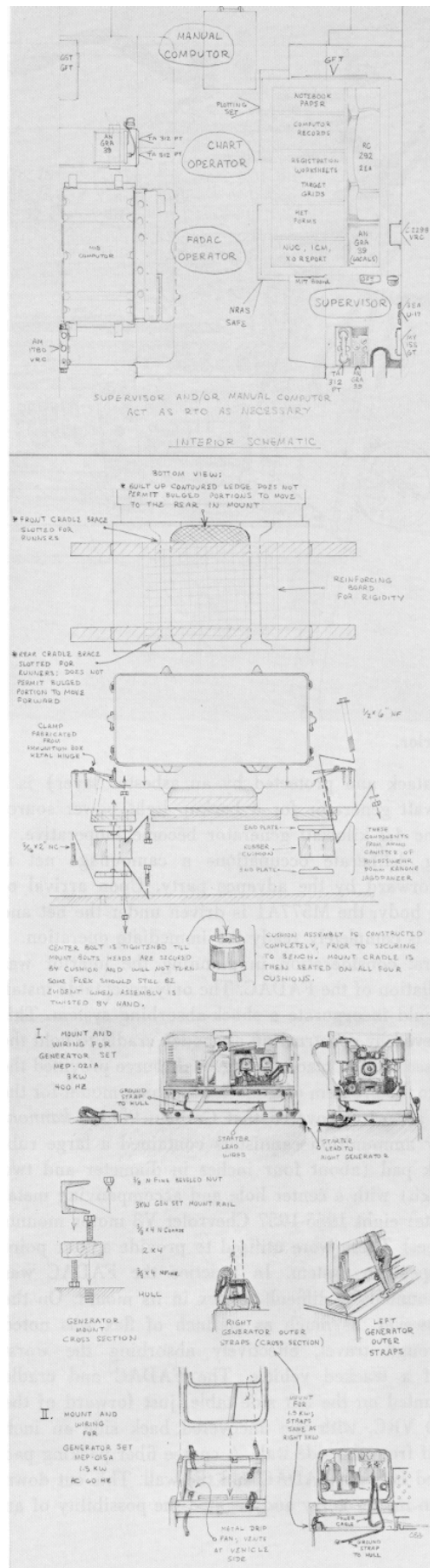
The FADAC table was secured against the forward engine compartment wall, locked in place behind the TC stand — its sole purpose was as a backup mount for FADAC if the M577A1 were to become inoperative. The FADAC would be moved to the battery operation center (BOC).

Finally, provisions were made for a second chart. If the FADAC were to become inoperative, a check chart would be needed. The check chart was mounted on laminated fiberboard and was hung between the handrails, above the FADAC and supported horizontally when not in use. A dual chart setup was considered too space-consuming and was also impractical due to the availability of only one RDP, the other being in use in the BOC.

With time being our greatest enemy and the fear of poor internal battery communication cutting our mission times, the communication system shown in TC 6-50-1 was modified. The traditional hot loop was installed. Instead of having each gun run a line in to a terminal strip or MX155 (then a precabled wire to the FDC), each gun runs a line to the FDC, hooking into a homemade rod box and terminal strip combination. This allows the guns to utilize alligator clips for speed in an emergency mission, yet use the terminal strip in a deliberate occupation. The rod box is one hot line to all guns. The terminal strip allows the FDO to fire by platoon or battery. In the interest of conserving space the MX155 is used as a miniature switchboard in conjunction with the terminal strip. A duplicate rod box-terminal strip is mounted to the rear of the BOC utilizing the SB-22. This allows the battery flexibility if the M577A1 were to become inoperative. The BOC is capable of continuing the same control.

All of these ideas are those utilized by this unit to achieve the speed necessary under ARTEP. It is not intended to infer that this is the only answer — only a means that worked for this unit.

CPT Anthony N. Kuykendall, FA, commands B Battery, 1st Battalion, 14th Field Artillery, 2d Armored Division Artillery.



Part IV The Field Artillery Buildup

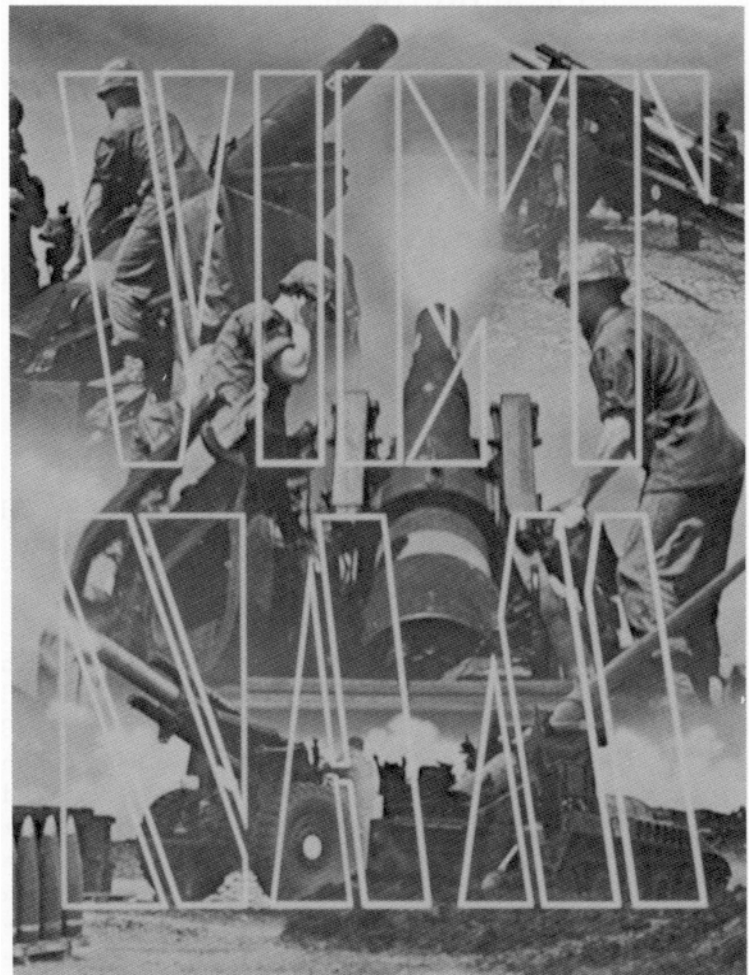
The year 1967 saw a continued growth in the number of field artillery units in the Republic of Vietnam. During that year, 11 nondivisional field artillery battalions arrived in Vietnam and began supporting operations in various parts of the country. They were joined by three additional division artilleries. In January, the 9th Division Artillery set up its headquarters in Bearcat, and in late 1967 the remainder of the Screaming Eagles of the 101st Airborne Division joined their 1st Brigade. In a ceremony held at Chu Lai in September, 1967, Task Force OREGON was redesignated the 23d (Americal) Division and, thus, was also born the Americal Division Artillery. The task force had been in existence since mid-1967 and was composed of three separate infantry brigades.

In contrast to the previous year, 1967 was highlighted by large scale, multidivisional operations. The year was only a week old when Operation CEDAR FALLS began. Controlled by II Field Force, CEDAR FALLS involved the 1st and 25th Divisions, the 173d Airborne Brigade, the 11th Armored Cavalry Regiment and separate battalions of the Army of the Republic of Vietnam. The operation was directed against the enemy Military Region IV headquarters and strongholds in the Iron Triangle region of III Corps. The success of the operation (389 enemy killed, 471 defectors) attested to the ability of the Free World forces to work together, fight side by side and produce a well coordinated, multidivision offensive.

While CEDAR FALLS was in full swing in the Iron Triangle, II Field Force planners were putting the final wraps on plans for subsequent operations. The largest offensive planned to date, Operation JUNCTION CITY, had been on the drawing boards for months. It was aimed at Viet Cong and North Vietnamese Army strongholds in War Zone C, in northern Tay Ninh Province, which had long been a major Viet Cong stronghold and the location of the headquarters for the Central Office of South Vietnam (COSVN). COSVN, the controlling headquarters for all Viet Cong activities in South Vietnam, had always been an elusive target and continued to be throughout the war.

Committed to JUNCTION CITY were two US divisions (1st and 25th), five brigades (173d Airborne; 196th Light Infantry; 199th Light Infantry; 3d Brigade; 4th Division; and 1st Brigade, 9th Division) and the 11th Armored Cavalry Regiment. II Field Force, Vietnam, under the command of LTG Jonathan O. Seaman, was the controlling headquarters for the operation. II Field

1967 Combat Operations



by MG David E. Ott

Commandant, USAFAS

Force Artillery, commanded by BG Willis D. Crittenberger, provided six field artillery battalions and four batteries of Dusters (40-mm) and quad.-50 caliber machine guns from the 5th Battalion (AWSP), 2d Artillery. II Field Force assets were divided equally between the 1st and 25th Divisions, the two major subordinate elements. An additional 11 artillery battalions were committed to the operation in various support roles. A list of the participating field artillery units is shown here:

II Field Force Artillery Units

7th Bn, 9th FA (105 T), attached 1st Div
2d Bn, 13th FA (105 T), attached 25th Div
2d Bn, 11th FA (155 T)
6th Bn, 27th FA (8/175)
2d Bn, 32d FA (8/175)
2d Bn, 35th FA (155 SP)
5th Bn, 2d ADA (AWSP)

25th Infantry Division Artillery

1st Bn, 8th FA (105 T)
7th Bn, 11th FA (105 T)
2d Bn, 77th FA (105 T)
3d Bn, 13th FA (105 T)
3d Bn, 82d FA (105 T) OPCON, DS 196th Bde
Btry A, B, C, 11th ACR, OPCON, Supporting 11th ACR

1st Infantry Division Artillery

1st Bn, 5th FA (105 T)
1st Bn, 7th FA (105 T)
2d Bn, 33d FA (105 T)
8th Bn, 6th FA (155/8)
3d Bn, (Abn) 319th FA (105 T) OPCON, DS 173d Abn
Bde

JUNCTION CITY was initially a two-phase operation. Phase I (22 February-17 March 1967) called for a coordinated assault into western War Zone C and search and destroy operations against the Central Office and enemy forces and installations in the area. Phase II (18 March-15 April 1967) called for a shift of emphasis to eastern War Zone C and continuation of search and destroy operations throughout the remainder of the war zone. The success of these first two phases resulted in a third (16 April-14 May) which called for a continuation of search and destroy operations to the southern edge of the war zone and the provision of security for the city of Tay Ninh and the town of Soui Da. For Phase III, II Field Force passed control of the operation to the 25th Infantry Division.

The objectives of Operation JUNCTION CITY were accomplished to varying degrees. The Viet Cong lost 2,728

soldiers. A number of his base camps and supply caches were destroyed, forcing him to move. Although the operation did not destroy the enemy's capability to wage war, JUNCTION CITY can be said to have put him significantly off balance and to have eliminated War Zone C as a haven for enemy units. During the operation, US forces constructed in War Zone C three C-130 airfields and two civilian irregular defense group camps, giving Free World forces readily accessible points from which to launch future operations in the area should the need arise.

JUNCTION CITY required most of the US ground forces available in the III Corps area, and a commensurate amount of field artillery supported the operation. The massive coordination effort dictated by the employment of the equivalent of 17 field artillery battalions was effected with surprising ease. The completeness with which the operation was planned is, in large part, the explanation for its success. To facilitate command and control of the operation, II Field Force for the first time displaced a tactical headquarters to the field. Colocated with the tactical command post was the II Field Force Artillery command post. In addition, II Field Force Artillery tapped the resources of its 54th Artillery Group to provide a controlling headquarters for the separate howitzer batteries of the 11th Armored Cavalry Regiment. The technique proved to be a success in aiding the coordination between firing units. For the remainder of the field artillery battalions, existing liaison sections proved sufficient in strength to provide liaison between units. Unit boundaries were used as fire coordination lines throughout the operations, and the II Field Force fire support plan authorized direct coordination between divisions and supporting artillery groups. Field artillery fire planning was accomplished by division and separate brigades.

The most significant combat action during Operation JUNCTION CITY took place around Fire Support Base GOLD, 17 miles northwest of Tay Ninh. The fire base was occupied jointly by the 2d Battalion, 22d Infantry, of the 3d Brigade, 4th Division, and the headquarters and all firing batteries of the 2d Battalion, 77th Field Artillery. At 0640 on 21 March infantry patrols sweeping the area around GOLD made contact with elements of a Viet Cong force apparently preparing to attack the base. The contact prematurely triggered the enemy attack which began with heavy fire from recoilless rifles, rocket-propelled grenades and 60-mm and 82-mm mortars. At 0715 the Viet Cong launched a coordinated ground assault from the east, southeast and north with elements of five battalions under the control of the 272d Viet Cong Regiment. So violent was the assault that the enemy carried portions of the perimeter, but actions by the field artillery turned the tide. All batteries of the 2d Battalion, 77th Field Artillery, commanded by LTC John

W. Vessey, engaged the enemy with over 1,000 rounds in direct fire including 30 rounds of Beehive, the largest number of these rounds fired in a single engagement to date. At the same time three batteries within range added their fire. The batteries included Battery C, 1st Battalion, 8th Field Artillery (105-mm towed), to the south which delivered more than 1,000 rounds; Battery B, 3d Battalion, 13th Field Artillery (155-mm SP), which delivered almost 400 rounds; and a composite 8-inch and 175-mm battery from II Field Force Artillery to the south which provided additional support. Further fire support was provided by Air Force tactical air. During the attack two maneuver battalions of the 3d Brigade, 4th Infantry Division, were rushed to the scene, catching the enemy forces as they were attempting to withdraw and inflicting further casualties. The action in and around GOLD resulted in 635 Viet Cong killed (confirmed by body count) and seven captured with 65 crew-served weapons and 94 individual weapons. US losses were 31 killed and 109 wounded. The action was given the name Battle of Soui Tre after the fact.

Field artillery units involved in Operation JUNCTION CITY gained invaluable experience in employment, tactics and techniques in a large-scale, multidivision offensive operation. To help preserve the element of surprise, field artillery units usually fired preparations of short duration; the fires of large numbers of units were massed to insure the effectiveness of preparations while maintaining brevity. The lack of a large number of suitable field artillery positions was a problem. Thus, several artillery units often were consolidated at one location. Landing Zone



BLACKHORSE, at one point in the operation, housed 52 field artillery tubes: five 105-mm batteries, three 155-mm batteries and an 8-inch battery. The disadvantages of crowding artillery into one location and presenting a lucrative target were far outweighed by being able to mass accurately the fires of a large number of weapons from a few locations.

Since the element of surprise was essential, extensive position area surveys were impractical; the field artillery instead employed a relatively new technique called photogrammetric survey. Basically, the technique utilized air reconnaissance photos, the prominent terrain features in the photos serving as registration points and survey control points for position area survey. Although limited, the method proved far superior to that of obtaining coordinates by map inspection and served as a valuable expedient during the operation.

Several other artillery-related techniques used successfully during JUNCTION CITY deserve mention:

- Artillery warning control centers (AWCCs) played a vital role in the operation. The tremendous number of aircraft in the area, coupled with the large amount of constant artillery firing, necessitated timely and accurate artillery advisories for aircraft. The 1st and 25th Divisions operated centers for their respective areas of operation during Phase I of the operation. During Phase II, such responsibility was delegated to the direct support artillery battalion in each brigade area of operation. The advantage of this system was that the information was always current and did not have to be consolidated at a central location. One center in an area as large as that encompassed by JUNCTION CITY would necessitate an unacceptably heavy volume of radio traffic.

- High-angle fire proved to be more effective in penetrating the thick jungle foliage than low-angle fire because the projectile descended steeply, paralleling the tree trunks, so that the chance of its hitting a tree and detonating prematurely was reduced. High-angle fire in the jungle also assured added safety for supported ground troops. If high-angle fires detonated prematurely, they did so almost directly over their target. On the other hand, if low-angle fires detonated prematurely they did so some distance laterally from the target, possibly directly over the heads of friendly troops.

- During the operation, the effectiveness of the AN/MPQ-4A radar was proven. Careful planning prior to the operation resulted in the placement of radars to provide mutual and overlapping coverage of the various units and fire support bases. Each radar had primary and alternate directions of coverage. If a fire base came under attack, usually a radar at another fire base would pick up the enemy rounds before the radar on the fire base under

attack. This flexibility greatly enhanced the ability of US forces to deliver rapid counterbattery fire.

- On D-day, 22 February 1967, the artillerymen of Battery A, 3d Battalion, 319th Field Artillery, under operational control of the 2d Battalion, 503d Infantry, 173d Airborne, participated in the only US parachute assault conducted in the war. Led by the battery commander, CPT Charles C. Anderson, the entire battery parachuted into the area around Katum. The howitzers were dropped into the landing zone by C-130s. From a position established in the vicinity of the landing zone, Battery A provided direct artillery support for search and destroy operations conducted by maneuver elements in the vicinity of Katum.

In spite of the magnitude of the operation and the amount of artillery involved in JUNCTION CITY, there were surprisingly few problems. The most significant was in fire support. During the operation, field artillery fires were frequently lifted to accommodate tactical air support, which is a bad practice. If supporting fires are properly coordinated, the need to check fire rarely should occur. When it does occur, maneuver forces are slighted. Only when all available supporting fires, regardless of type, are able to function simultaneously will the best possible support be provided.

On the whole, JUNCTION CITY was a successful operation. In the years of combat that followed, US and allied forces maintained the capability of reentering War Zone C at will. All artillerymen participating in the operation could take great pride in having contributed so effectively to the accomplishment of the mission.

Perhaps it is only fitting that 1967, the "year of the big battles," should end as it had begun. Operation JUNCTION CITY began the year; the battle for Dak To ended it. Although much of the heavy fighting in 1967 took place in the south (i.e., CEDAR FALLS, JUNCTION CITY and the battle at Loc Ninh), Dak To was to the north in the Central Highlands of Kontum Province. The battle for Dak To was part of MACARTHUR, an operation that extended into early 1969.

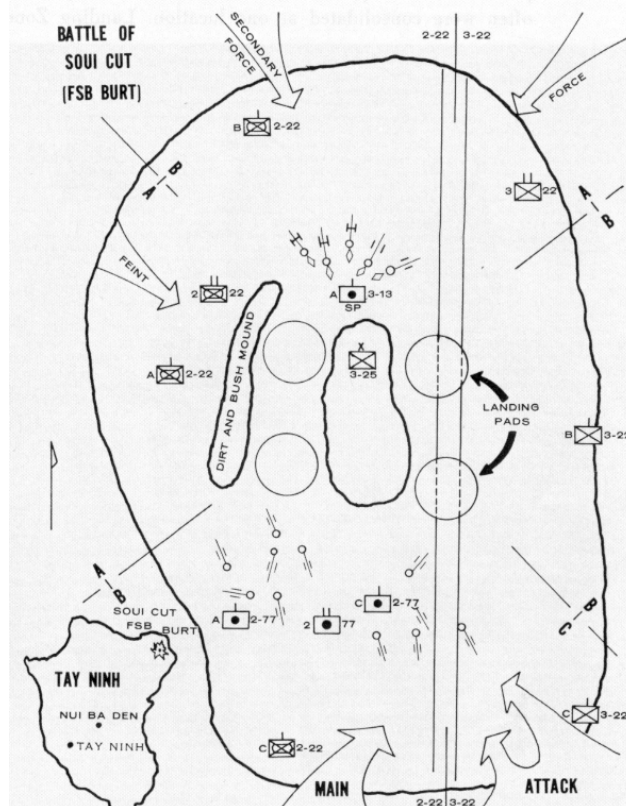
Reacting to intelligence reports that indicated a large buildup of enemy troops in Kontum Province, the 4th Infantry Division deployed its 1st Brigade to the Dak To airfield in late October 1967. On 2 November, a North Vietnamese Army reconnaissance sergeant defected and revealed that four infantry regiments and an artillery regiment were preparing to launch a large-scale attack against the Dak To-Tanh Canh area. This would have been the largest enemy offensive in the Central Highlands area to that time.

The 1st Brigade initially made heavy contact with the enemy to the south and southwest of Dak To throughout the first week in November. Augmented by the 173d

Airborne Brigade, the 1st Brigade maintained heavy contact throughout the Ben Het-Dak To area. Additional assistance came from the 42d South Vietnamese Army Regiment, operating to the east of Dak To, and from the 1st Brigade, 1st Air Cavalry Division, which blocked enemy withdrawal routes to the south of Ben Het-Dak To. As the fighting intensified, the enemy was forced to commit his reserves to cover his withdrawal toward the southwest. The bitter fighting that followed ranks with the fiercest of the war. The turning point of the action was the fight for Hill 875, which was finally taken by elements of both the 4th Division and the 173d Airborne Brigade but not before the hill received the heaviest concentration of tac air and all calibers of artillery bombardment of any single terrain feature in the II Corps area.

After the operation, MG William R. Peers, commander of the 4th Division, acknowledged the role played by the artillery in the battle: "The large number of enemy in the area and the fact that many of the contacts were against elaborately constructed enemy fortifications required that tac air and artillery be used at the maximum rates possible. The responsiveness of both air and artillery and the cooperation between them contributed greatly to the victory and was a real tribute to integrated direct support under difficult circumstances."

The artillery committed in the battle of Dak To consisted of 15 batteries of all calibers, with a total of 77 artillery pieces available for support. These figures do



not include the battery of aerial rocket artillery that became available when the 1st Brigade of the 1st Cavalry Division joined the operation on 11 November. Battery A (ARA), 2d Battalion, 20th Field Artillery, assumed a general support-reinforcing role. The US aerial rocket artillery, coupled with the enemy's use of rockets, led to the unfamiliar sight of rockets being employed against rockets.

Artillery expenditures for the 37-day period exceeded 150,000 rounds of all calibers. Artillery units completed 48 tactical displacements to meet the constantly changing demands of the battle. To eliminate fire support coordination problems, the 4th Infantry Division Artillery sent a tactical command post to Dak To on 9 November and US artillery batteries provided liaison personnel to the fire direction centers of the three supporting Vietnamese artillery batteries. The effectiveness of the fire support coordination effort is evidenced by the successful integration of 2,096 air sorties and 45 B-52 strikes during the operation. The battle of Dak To cost the enemy 1,644 lives and rendered three North Vietnamese Army infantry regiments ineffective, totally disrupting enemy plans for a major victory in the Central Highlands.

The holiday truce ended abruptly on New Year's Day 1968 for the defenders of Fire Support Base BURT, a 25th Infantry Division base located 10 kilometers south of the Cambodian border. Beginning with sporadic mortar attacks in the late afternoon, the enemy sent four Viet Cong battalions against the base. Among the defending units were two batteries of 105-mm and one battery of 155-mm howitzers. The enemy ground attack commenced minutes before midnight, the official end of the truce. After a diversionary attack on the west side of the perimeter, defended by elements of the 2d Battalion, 22d Infantry (Mechanized), the enemy launched his main attack from the southeast, a sector defended by Company C, 3d Battalion, 22d Infantry, and Battery C, 2d Battalion, 77th Field Artillery. As the enemy slowly worked toward the bunker line, the artillery shifted from countermortar to direct fire in answer to a call from the infantry command post. Battery C began firing a heavy volume of direct fire with both high explosive and Beehive ammunition. The enemy attack slowed in the face of the artillery but picked up to the south of the fire support base, a sector manned by Company C, 2d Battalion, 22 Infantry, and Battery A. 2d Battalion, 77th Field Artillery. Battery A commenced direct fire, and flare ships and armed helicopters were used extensively throughout the south side of the base. Fire Support Base BEAUREGARD, located 12 kilometers to the west, provided supporting fire west of BURT in an attempt to prevent the enemy from reinforcing or withdrawing in that direction. The 155-mm self-propelled howitzers of Battery C, 3d Battalion, 13th Field Artillery,

located on the north side of the fire base, supplied continuous direct fire to the north, northeast and northwest. In addition to the direct fire, indirect fire from both BURT and BEAUREGARD was shifted out to the road running south from BURT. Although they were not discovered until daylight, two enemy battalions were assembled on that road as a reserve force to exploit weaknesses in the perimeter. If weakness existed, the two battalions never found them. By 0300, tac air had arrived and was pounding the area to the south. The fires of the artillery gunships and tac air disrupted the Viet Cong attack: by 0600 contact was broken and 400 enemy lay dead in and around the base.

The artillerymen of the 25th Division played a vital role in the success of the operation. In addition to maintaining a constant stream of both direct and indirect fire, artillery personnel cut out hasty landing zones for resupply aircraft and broke out and distributed over 1,500 rounds of artillery and mortar ammunition and 200,000 rounds of small-arms ammunition, all during the hours of darkness and in the heat of battle. In addition, they established an improvised aid station in the fire direction center of Battery C, 2d Battalion, 77th Field Artillery, and assisted in the treatment and evacuation of the wounded.

The successful integration of infantry, artillery and air power had saved Fire Support Base BURT. The battle of Soui Cut is a typical example of many such actions that occurred during the war in Vietnam. It is representative of well coordinated position defense and fire support.

A second example of a determined defense by field artillerymen occupying a fire base occurred during the early morning hours of 14 October 1967. Battery A, 2d Battalion (Airborne), 320th Field Artillery (105-mm), and Battery C, 3d Battalion, 16th Field Artillery (155-mm), were occupying an unnamed fire base on a ridge line in support of elements of the 1st Battalion (Airborne), 327th Infantry, of the 1st Brigade, 101st Airborne Division, during Operation WHEELER. The fire base, which had been occupied for almost a month, was located halfway between Tam Ky and Thien Phouc in the I Corps region.

To assist in the defense of the base, a force of 75 civilian irregular defense group (CIDG) personnel manned the perimeter bunkers. For further security, Battery A nightly posted guards at each howitzer, the fire direction center and the ammunition section. Due to the difficulty in distinguishing them from the enemy at night, the irregulars had been instructed to remain within their bunkers during the hours of darkness.

The perimeter bunkers were on the edge of a steep dropoff along the narrow ridge line. The steepness of the slope made it impossible to observe activity directly below


the bunkers. It was up these steep slopes that a platoon of sappers crept during the early morning hours and prepositioned themselves for an attack on the 105 battery. Their objective was to capture the weapons and turn them on the 155-mm battery and infantry battalion headquarters, which were located on either side of the 105-mm battery position.

At 0320, in extreme darkness, mortars, rockets and recoilless rifles unleashed a devastating barrage on the area in conjunction with the sapper attack. Every position within the battery area was known to the enemy before the attack. The radios in the fire direction center were destroyed immediately. A sapper tossed a grenade into the center and then reached in and placed a satchel charge directly on top of the two VRC-46 radios. The enemy so effectively infiltrated the battery area that the artillerymen had no chance to repulse the initial attack; instead, the fighting began within the parapets. That the crewmen of the weapons were able to return fire with their howitzers testified to their discipline and courage. Although the enemy seemed to be everywhere in the battery area, the battery commander, executive officer and first sergeant, though wounded, moved from weapon to weapon, helping the more seriously wounded and assisting in the delivery of fire.

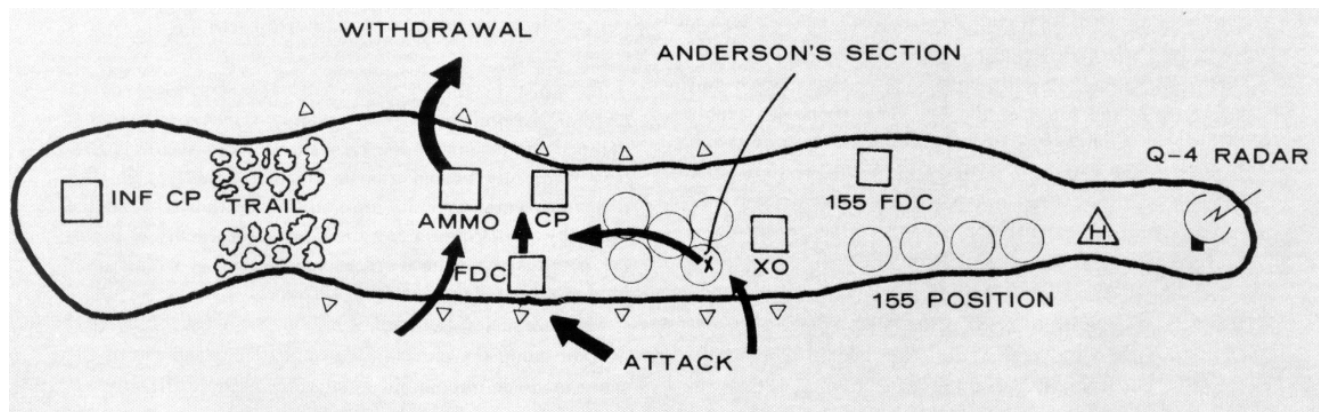
Each weapon parapet had its own private war going by this time. All the men of number 1 section had been wounded by the initial mortar attack; nevertheless, the section chief, SSG Webster Anderson, and his men moved into the parapet and directed fire upon the enemy. Grenades fell all around them, but neither Anderson nor his men faltered. Two mortar rounds landed at Anderson's feet and severely mangled his lower legs. Although in great pain, he managed to move around in the protective parapet and continued to inspire his men. When a grenade landed next to one of his wounded cannoneers, Anderson grabbed the grenade and threw it from the parapet. In the process,

his hand was blown off. The executive officer came upon number 1 weapon at this time and, seeing Staff Sergeant Anderson's condition, moved him to medical aid. For his action, Staff Sergeant Anderson later received the Medal of Honor.

By now the battery commander had retrieved the sole remaining radio and had directed defensive fires upon the enemy weapon positions. These fires, in conjunction with direct fires from the 105-mm howitzers, silenced the enemy. The Viet Cong were finally driven from the battery perimeter after more than two hours of close combat. The infantry battalion headquarters and the 155-mm battery had not received a single enemy round during the battle. Because of the unknown nature and size of the enemy force, these two units were forced to man their own defenses and were initially unable to assist Battery A. Because of extremely bad weather, the only aircraft flying that night were medical evacuation helicopters, and even they had to be directed into the fire base by the battalion Q-4 radar, which was collocated with the 155-mm battery. A total of three medevac aircraft evacuated the wounded and dead from the battery area under the worst possible flying conditions.

Morning found Battery A with six killed and 29 wounded out of an initial strength of 49. Twenty-two of the wounded required evacuation. The civilian irregulars lost six killed and five wounded. Fifty-six craters from 82-mm mortar rounds were counted in the battery position. At least five mortar rounds had landed in each section parapet. Rocket and recoilless rifle flashes had been observed and fired upon by the 105-mm and 155-mm batteries. Although the 105-mm battery was hurt badly during the attack, the objective of the enemy force was not realized. The field artillerymen stood by their weapons in the face of overwhelming odds and repulsed the enemy from the battery area without losing a single howitzer. 

Battery A, 2-320th Field Artillery Firebase.



on

target acquisition

by COL (Ret) Arthur R. Hercz

Since the *Journal* has been giving considerable space to the problem of target acquisition, it is interesting to compare the ideas in three articles by members of the Field Artillery School which appeared in recent issues. These articles are: Brigadier General Lewis on "Evolving FA Tactics and Techniques" which emphasizes the traditional mission of field artillery as being primarily to help the maneuver elements by close and direct support. Colonel Pearson's "Historical Precedents for Today's Modern Battlefield" provides a likely background for conditions to be confronted in a major war against a modern Russian army in Europe. Colonel Rhea looks more closely at "Target Acquisition Today...Tomorrow."

Based on some historical background and personal experience in the field I would like to comment on some of their implications. My discussion will be limited to the specific problem of a general organization for enemy battery location, to include heavy mortars and rockets. And rather than stick to the rather amorphous designation of "target acquisition" (TA), I prefer the more descriptive and specific term of "counterbattery intelligence" since the primary function of these units is the accurate location and identification of enemy indirect fire weapons and the chief techniques (sound-ranging, night flash-ranging, counterbattery radar) are designed for this specific purpose.

It is apparent that now, as in the past, the FA School is decidedly division-oriented and its primary concern is *close support* in which our own plan of maneuver predominates.

••• AGGAIN

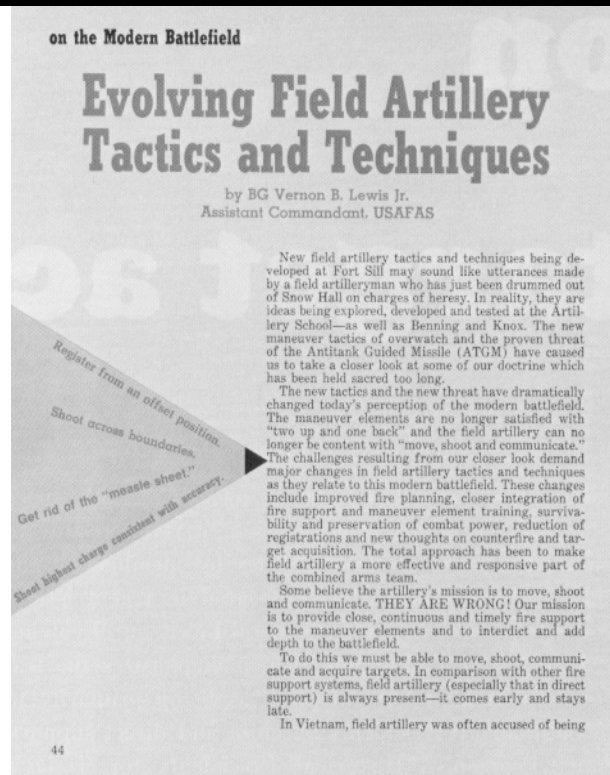
This is emphasized in General Lewis' article by his statement: "We believe that the fight will be won or lost at the brigade level or lower." While this has been basic doctrine for a long time we also must recognize that success at these lower levels is largely affected by factors outside their immediate areas of influence, as demonstrated in Colonel Pearson's article; and it is one of the jobs of the field artillery to neutralize the chief one of these, the enemy artillery.

General Lewis also states, "In the counterfire concept, all our target acquisition resources . . . will be triggered by the direct support battalion or by the brigade or maneuver battalion FSC . . . those who can most accurately and rapidly assess the location and severity of the enemy fire." And further: "On the battlefield the target acquisition elements will go where they can best serve the needs of the direct support battalion." These ideas seem to assume counterbattery action based on what areas enemy fire is falling into at the moment rather than a systematic ferreting out of the source. The enemy battery, which at one moment is shooting into the rear area of Division A, may soon be hitting the forward elements of a brigade in Division B — yet the location and identification problem has not changed.

These quotations would seem to indicate that the recent Vietnam experience is exercising undue influence on our tactical thinking. Not only was the enemy artillery action there on a relatively small scale until near the end, but our target acquisition units were not used to good advantage when they were available. Therefore, the Vietnam conflict should not be used as a model in redesigning our counterbattery organization if we are to be prepared against a major modern army. The doctrine indicated here could be fatal when facing Russian steamroller tactics described by Colonel Pearson.

The Field Artillery School has always given some lip service and some cursory attention to counterbattery operations, but it has never put much serious effort into these, nor recognized some of the peculiar problems involved. As a result, they deceive themselves into believing that they currently have an effective counterbattery intelligence capability. If, because of greater frontages plus the increased range, power and mobility of weapons, the division is to get the responsibility for counterfire and therefore needs prompt counterbattery information, it is an over-simplification merely to decentralize the present target acquisition units by eliminating the battalion headquarters battery and assigning one letter battery to each division.

However, since the present organization of counterbattery units (as modified) dates back to the early 1930s, it is appropriate to reconsider the basis of the



organization and to test whether previous assumptions and conditions are still applicable. Therefore, it may be useful to review some of the thinking behind our present organization.

A Bit of History

The assignment of primary responsibility for counterfire, and with it counterbattery intelligence, to corps artillery was only partially based on the concentration of our heavy and long range weapons at corps level.

At that time division sectors were considerably smaller than those now contemplated. It is interesting to note the progression resulting from developments of weapons, mobility and communication. In World War I a typical division front was around 10 km. Preliminary estimates for World War II doubled that and, on such basis, the observation battalions were assigned two letter batteries. By the end of the war there were 18 of these battalions deployed in France and Germany, with others in Italy and the Pacific Theater. However, from combat experience the unanimous recommendation was to increase the observation battalion to three letter batteries to adequately cover a corps front of those days. Now the estimate for frontages has increased again to where a division covers some 40 km.

Divisions were moved in and out of the line and boundaries were changed with changes in our own tactical

plans. By contrast, corps sectors were relatively stable, natural geographic areas. By being assigned to corps rather than divisions, the observation battalions could occupy the most favorable terrain for their operations without the frequent position changes inherent with divisions. In the larger corps sectors sensor positions could be selected based on enemy capabilities and terrain favorable to their instrumental characteristics, regardless of overlap of division boundaries, and could get comparative data over a longer period of time.

It was found from experience that control of counterbattery intelligence agencies and the correlation of the information that they and other sources produced required a full-time specially knowledgeable staff section, which corps artillery was able to provide.

As to the current ideas for decentralization of counterbattery intelligence agencies there are some precedents. In WWII, after the German successes in Poland, France and North Africa, our army was obsessed with the idea of speed. This led to some very unrealistic large-scale maneuvers which emphasized "getting there furthest" but disregarded "getting there with the mostest." Among other things, this doctrine called for training of reduced sound-ranging and short-base flash-ranging teams, to be attached to division artillery or direct support FA battalions. These attachments never were employed effectively, even in training at Fort Sill or on maneuvers. In Africa their first and (to my knowledge) only use in combat resulted in the loss of the entire team. As Colonel Ellerson, commanding the 1st Observation Battalion at the time, commented concerning actual combat, even in such a fluid situation as that in North Africa, "the tempo is a little more majestic." Later separate sound-ranging platoons were trained under this doctrine and were sent to the Pacific Theater. I have no information on their effectiveness, but judging by the lack of data available it would seem that they did not contribute enough to warrant reporting. The general conclusion from our experience in WWII would be that decentralization of counterbattery intelligence agencies was tried and failed.

On the other hand, with combat experience many higher commanders became aware of the value of the battalion units and requested more of them. One indication of this is provided by the loading schedules for assault landings. In such operations each unit must be justified to warrant taking up scarce space. So the following progression, based on actual combat experience, is of interest:

| Landing Operation | Firing Bns. | Obsn. Bns. | Ratio |
|---------------------------|-------------|------------|-------|
| 1942, N. Africa (Tunisia) | 28 | 1 | 1/28 |

| | | | |
|------------------------|----|---|--------|
| 1944, Normandy | 47 | 3 | 1/15.7 |
| 1945, Honshu (planned) | 61 | 8 | 1/7.6 |

As an aside: there is now one target acquisition battalion plus four incomplete target acquisition batteries in the Army for some 100 firing battalions.

There is another precedent from WWII worth noting. The Germans, who did not have the same sort of corps organization, had an observation battalion (*Beobachtungs Abteilung*) organic to each division. Further investigation of their experience in this connection would be useful, especially their effectiveness against Russian artillery.

General Considerations

1) While the range, power and mobility of our weapons may have increased appreciably since WWII, the counterbattery locating systems have not improved correspondingly, even though radar has been added.

2) Enemy battery location has characteristics of both "instrumental reconnaissance" (to use the Russian term) and intelligence operations. It must be recognized that this is quite a different problem from close support within the area of influence of the ground-gaining arms.

3) Employment of instrumental reconnaissance must be based on the characteristics of the respective systems, not on those of counterfire weapons. Counterbattery



locators are not switched on and off by our controllers, as General Lewis indicates, but depend on enemy fire activity. However, some *active* systems (radar, FAALS) may be silenced for security reasons.

4) The various instrumental techniques are complementary and generally cover the same area. Radar helps to fill in some of the blanks left by sound-ranging and flash-ranging, but the various locating devices supplement each other rather than compete.

5) Lack of continuity of divisions in position on the FEBA, as compared to corps, is a factor. This is particularly important in counterbattery intelligence analysis.

6) In a major European war, with our long and vulnerable supply lines, we cannot be as lavish in our ammunition expenditure for counterfire as we were in Vietnam, where we retaliated to minor rocket and mortar attacks by drenching all suspected and possible sites with quantities of fire. We will have to make every round count.

7) It is a common human failing (by no means limited to the military) to recognize chiefly the anticipated advantages of new systems and to stress the limitations rather than the capabilities of existing familiar ones. Systems under development seldom come up to full expectations. Therefore, it behooves us to base our plans on proven performance and to await fuller field experience with new systems.

8) A good case can be made for the idea that FA no longer plays a subsidiary role; rather that most modern battles seem to be won by massed firepower (FA and air) after which the maneuver elements move in to occupy the area and mop up. This is certainly the impression one gets from Russian doctrine of massed artillery. It is also most economical from our viewpoint of substituting iron for blood. In both World Wars, attacks have generally succeeded or failed as a result of mass and especially effective opposing firepower. This view also is consistent with our current doctrine of emphasis on firepower together with an extreme thinning-out of our ground-gainers, as indicated by Colonel Rhea's schematic of frontages.

Space and Time Factors (Tactics)

The assignment of target acquisition units not only needs to be tailored to particular theaters, but also within any corps sector their organization for combat is likely to vary with terrain, enemy artillery capabilities, our plan of operation, etc. The most efficient way to use such units is to assign and to leave to the battery commanders, with guidance from their battalion, the means to be used and positions to be occupied. The method of executing the

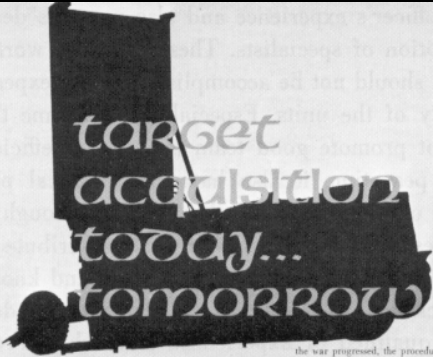
mission is a technical problem which requires detailed knowledge of techniques and personnel available. Often it will be necessary to observe from one brigade or division area into an adjacent one, or for a base to overlap boundaries. This also will be true of systems under development. Therefore, except when divisions or brigades are operating independently, TA batteries need to be coordinated at corps level.

The proposal of organically assigning one target acquisition *battery* to each division apparently results from applying the traditional organization charts to anticipated conditions, but without adequate consideration of the capabilities and requirements of the instrumental reconnaissance. Simply assigning TA units wider fronts does not mean they can stretch their resources correspondingly. It seems expected now that a division will cover as much ground as the old corps did. Therefore, based on present techniques, a TA battalion is *needed* for the equivalent of a division front. This would be especially true in view of the Russian predilection for great masses of artillery, far beyond what we encountered from the Germans in WWII. (Again, see Colonel Pearson's article.) The locating systems now under development are not likely to change this estimate much.

Target area assignments of TA units should not be based on the concentration or dispersion of our own divisions or immediate brigade objectives. Our divisions may be massed for an attack or dispersed at other times. This is no reason for similar massing and dispersing of TA units. Furthermore, when divisions are massed for attack this is preferably done as short a time before H-hour as possible. This would not permit organic division TA units to operate effectively in time to support the attack. "Triggering the target acquisition resources" when enemy artillery opens up on our maneuver elements is often too late.

The time factor is generally considered in terms of immediate response to enemy fire. Such reaction time, of course, must be reduced as much as possible through improvements of technical means and by organization of fire direction channels. When so directed there is no real problem in transmitting locations promptly to counterfire units at any level.

Like any intelligence agency, it is also important to have continuity of data collection and evaluation within any particular area, to note changes in enemy artillery patterns. It is largely by comparison of firing information over a period of time that true active battery locations can be sorted out from offset positions and dummies, and to analyze the enemy's fire support plan. This continuity can only be achieved at corps level, which is more stable within geographic areas. Divisions and especially



by COL Donald M. Rheu

Today, much thought is being given to the battlefield of the future, and our doctrine, tactics and techniques are being revised accordingly. There is a recognition that the improved weapons of today are capable of destroying any target which can be "seen"—locating the target with sufficient accuracy so that it can be attacked. Along with the improvements in weapons there has been a comparable improvement in mobility. Looking to the future, one sees even better weapons and improved mobility. The end result of the combination of these improvements will be, in all probability, a very abbreviated conflict which will last for a period of months or weeks as opposed to years as was typical of World War I, World War II, Korea and Vietnam. We must be fully trained prior to the start of the conflict because the duration will permit little time for reinforcements to arrive.

Early Target Acquisition

Target acquisition is widely recognized as one of the more serious deficiencies in the Field Artillery. A review of World War II indicates that initially target acquisition consisted of sound ranging and visual observation. As

the war progressed, the procedures for integrating target acquisition assets were developed; however, there were no new successful devices or systems introduced. Evidence of the importance of target acquisition during this conflict was demonstrated by the formation of the Observation Branch which was a part of the Gunnery Department within the US Army Field Artillery School in 1942 and became a separate department in 1945. At the close of World War II, there were 26 field artillery observation battalions. In 1949 there was one FA observation battalion in the active Army, four in the National Guard and the emphasis on target acquisition had once again disappeared. In the Korean Conflict, there were few FA observation battalions and initially the only observation battalion was reorganized into a 105-mm howitzer battalion. By the end of the war there were two battalions in Korea and seven in the United States.

During the Vietnam War, the target acquisition (observation battalions were renamed in 1961) units were generally used piecemeal. Commanders were constantly plagued with the problem of acquiring targets, especially mortar, artillery and rocket firing positions. A variety of target acquisition equipment was used, to include sound ranging, flash ranging, moving target locating radars (AN/TPS-25 and AN/TPS-50), unattended ground sensors, weapons locating radar (AN/MPQ-4A) and the ground surveillance radar (AN/FPS-5). Some units established counterbattery operation centers. In many units, when incoming rounds were received, the procedure was to fire all available artillery at suspect locations previous

7

only a more experienced special battalion staff can provide.

Under the proposed organization, the tactical and technical decisions relating to counterbattery intelligence would be given to the S2 of division artillery, as well as the compiling, evaluation, etc., of counterbattery information. This would put a considerable new load on this staff section for which its numbers and training would have to be increased. At present such officers do not have the necessary detailed knowledge or experience with TA systems. While computers can be a great help in compiling data and, to a limited extent, in correlation, they are still just tools. The staff must still interpret the data and grind out decisions.

While many artillery staffs like to receive the product of TA units (and some even use it), staff officers generally do not want to, and should not, be bothered with the nuts and bolts of unit operation. Even the corps artillery found it necessary to leave these detailed operations to TA battalion headquarters. It is reasonable to expect a busy division staff without a counterbattery section to do the same.

It should be noted that the basic building block of organization is the battalion rather than smaller units which do not have provisions for their own technical staffs. Practically all services, as well as combat arms, have such battalion structure. The idea of smaller cellular units was tried during WWII and was a dismal failure.

Survey

The idea of taking survey away from the TA units is a step backward from experience. The emphasis on surveying in TA battalions and consequent higher standards is the result of internal need and development over a long time in both peace and war. The TA surveyors work at their assignment as a primary, full-time job and are organized and qualified technically for it. For nearly as long divisions have been provided (on paper) with their own survey capability, but due to the lack of interest and technical supervision they have rarely been able to perform adequately when needed. More often they have been diverted to other duties. Therefore, by default, TA units generally have provided survey control direct to firing battalions. It would be unfortunate to throw away this experience and to repeat the slow development process from scratch.

Based on such experience, transfer of all survey functions to G3, actually headquarters battery, does not seem a practical solution. The reverse, i.e., putting all survey in the TA battalion, has been demonstrated to work better. Again, the more geographically-stable corps units can provide survey control direct to firing battalions as these arrive in a new area. The TA survey control can

be planned and coordinated over a greater area. Such broad survey control is implicit in General Lewis's suggestion that division artillery be able to fire into adjacent sectors. The division level simply would be a redundant link in such survey control.

The new developments in survey equipment will simplify and speed up the survey process but will not reduce the need for it. It has been found that topo engineer units are not geared to turn out the quick results needed for artillery. And since such survey is also required for the TA agencies, the present system has proven in the field to be the most practical.

Personnel and Training

Organization charts do not make an operating service. Modern equipment (when in existence) provides the necessary tools, but the most essential and difficult element to provide is properly selected and adequately trained men. "Target acquisition resources" are not just sets of tools to be "triggered by FSC," but trained technicians, expert in coordinating and using special instruments. Now, in spite of renewed interest in TA and increased status of the TA Department, the operating policy of the Field Artillery concerning personnel assignments, training and active units is no better than for the past 30 years.

There seems to be some sort of implicit concept that any artilleryman can become a sound-ranger, etc., simply by assignment to the appropriate unit or, at most, with a couple weeks of schooling. There is little recognition of the fact that training for these special units is as involved as for firing types and that each system is quite different from the others. While it is true that at least the officers and senior NCOs of TA units must have basic artillery training, it does not follow that any FA officer or NCO can fill a TA slot without considerable additional technical and tactical training. Just as FDC personnel are carefully selected, trained and earmarked, so TA personnel must be handled.

Such scarce, specially trained men must not be wasted, especially during wartime. Commanding officers must understand the peculiarities of the jobs and make assignments accordingly. Since in a division such a small number of each type would be assigned to each battery, it cannot be expected that division staffs would give the necessary time to their problems. In WWII, even when larger numbers of each specialty were concentrated in battalion units under commanders of similar training, it was often impossible to get the trained men matched to appropriate slots.

Some commanders try to rotate officers among the several jobs with the idea that on-the-job learning broadens

the officer's experience and also prevents dead-ends in promotion of specialists. These are both worthy objectives, but should not be accomplished at the expense of the integrity of the units. Especially in wartime this policy does not promote good team training or efficient operation. In peacetime it also hampers technical progress since an officer is on the job only long enough to learn his duties, but not long enough to contribute to improving the system. The necessary background knowledge is not picked up that readily, and the rotation does not make for qualified or experienced leadership. From the individual's point of view there is little incentive for qualified officers to seriously study and work to develop the various TA techniques if, at most, they can aspire to a battery command in this field.

All this is not to imply that TA personnel need to be supermen, but they do need some selection for particular aptitudes and special training. General Halder, in his Historical Division Report on *German Observation Battalions*, states that "in the German Army it required an energetic educational effort and a particularly careful personnel policy over 20 years to bring the understanding of the problems of the 'Artillery Intelligence' to a level to be of general value." Our own experience prior to and during WWII confirmed this observation.

We must not become so wedded to organization charts and map exercises that we lose sight of real life factors and demonstrated field experience. One problem with assigning smaller units (batteries) to division artillery is that the best men are "borrowed" for positions where they show up to inspectors or for routine assignments. Since TA is difficult to demonstrate dramatically against a simulated enemy, key men are often diverted for FDC, checking gunnery results, etc., and their primary jobs are neglected. A good example of this process is familiar in many division artillery survey teams and intelligence staffs. Even though these specialists may at one stage of their training have been properly qualified, it has been common experience that such sections are regularly diverted from their own functions to "fill in" at more immediate jobs. In WWII this resulted in very few divisions having qualified survey sections, even though they were carried as such on T/O. If a viable TA organization is to be developed it is essential to earmark all key personnel of TA units with critical MOS.

At present there is not intensive training given for TA units comparable to that for firing units. Some individual basic training is now given in the Target Acquisition Department of the FA School; however, compared to the training for firing units, the course is too short and rather elementary. Considerable additional advanced and unit training for and by experienced officers is required to

develop effective team action under varied field conditions. For this, especially in wartime, trained personnel are needed for supervision and guidance. This can be handled best in larger specialized units of at least battalion size. No such guidance is available to single batteries within divisions. Division artillery staffs cannot be expected to have much understanding of the particular problems nor time to devote to them. In fact, efforts to coordinate realistic field exercises with TA training are likely to conflict with gunnery demands and safety regulations.

As Colonel Rhea points out, in the current situation the TA units "must be fully trained prior to the start of a conflict." There is not only no such training available now but an adequate number of units does not even exist. The time is late for us to foist this responsibility onto division artillery staffs, whose training and interests are remote from the problem.

Conclusions

From this discussion it seems obvious that the proposed single TA battery for both division and corps artillery is inadequate for our counterbattery needs, and that such a unit organically assigned to division cannot be used efficiently. The original reasons for organizing counterbattery intelligence, under corps artillery, in battalion units, are generally still valid; but with expanded frontages and depths more such units are required for each corps. It also seems to me that the limit one TA battalion can reasonably control is three letter batteries. It is, therefore, suggested that:


- 1) TA units should continue to be organized as battalions with organic TA batteries.
- 2) Assignment of such *battalions* to any corps should be tailored to the particular theater; generally on the basis of one conventional TA battalion for each division front and one long range TA battalion per corps.
- 3) Continue the *capability* of attachment or support missions of TA battalions or batteries to lower units, especially when these operate independently. (Details of internal organization of TA units are not considered here.)

A Final Word

For the past 30 years the Field Artillery has consistently underrated the requirements for and needs of a counterbattery intelligence service — and continues to do so. This is reflected in the superficial training given in the specialized fields, the token active units, the sketchy R&D program and the haphazard personnel policies. Most recently, the proposed corps and division TA batteries are completely inadequate for the anticipated frontages and opposing artillery.

The importance, scope and difficulty of the problem have not been faced up to since early in WWII. There has been no in-depth training of officers in this field comparable to that for firing units, although the technical aspects are at least as involved. Therefore, there is a tendency to equate the counterbattery intelligence problem and its instrumental observation with the more familiar close support and its corresponding direct observation. This is a considerable over-simplification.

It is deceptive to think that adequate provisions for counterbattery intelligence have been made by authorizing a TA organization or simply by providing new hardware. Wars are not won with paper units. This whole discussion is a pointless academic exercise unless and until our service is willing to dedicate the men, the resources, the staff effort, continuous intensive training and long term R&D to produce an effective counterbattery system *in being*. The failures of the past cannot be corrected overnight, and there is much catching-up to do. It took the Germans 20 years to develop such a system and it took us a similar time to develop a barely adequate cadre before WWII. We do not have such a base now and we have wasted 30 years kidding ourselves that by putting TABs on paper and giving some superficial orientation courses that we can produce an adequate operating service from token organizations on short notice. So there had better be a serious start very soon with a systematic long-range program.

Much of the brave talk of what our TA service can or will be able to do in counterbattery intelligence is too reminiscent of the title of an old book: "The Valor of Ignorance." 

COL (Ret) Arthur R. Hercz, FA, is former director of the USAFAS Observation Section (now Target Acquisition Department).

FA Supports

Whenever field artillery support of a covering force is discussed, three principles come to mind:

- Supporting artillery should be at least as mobile as the maneuver elements of the covering force.
- Supporting artillery should contain a mixture of calibers to assist in deceiving the enemy as to the composition and location of the main force.
- Supporting artillery may be attached to the covering force when distances between that force and the main force are so great that control by higher artillery headquarters is infeasible.

US Army divisions likely to employ covering forces (armored and mechanized infantry divisions) are equipped with self-propelled artillery as mobile as any covering force such divisions might be expected to field, so the first principle will normally be satisfied with no problem. Also, armored and mechanized infantry divisions are equipped with 155-mm and 8-inch howitzers in adequate numbers to provide deception through employment of mixed calibers with the covering force, thus satisfying the second principle as well. Moreover, reinforcement by or attachment of 175-mm guns can be used to enhance deception.

The third principle, however, while sound in the conventional context of the covering force, warrants close examination when applied to covering forces likely to be employed in the initial defense of Western Europe. Two major factors influence covering force tactics in that environment.

- A recognizable international boundary separates hostile forces and clearly delineates where "friendly" terrain stops and "hostile" terrain begins.
- Availability of friendly forces may require very wide division sectors with all brigades employed and relatively small forces in reserve. Gaps between defensive formations will have to be covered by direct and indirect fires.

In many cases, good defensible terrain exists close to the border and the distance between the covering force and the covered force will be shallow. In others, flat

terrain exists and greater depth will separate covering forces from the main defense. This article will concentrate on the situation in which good defensible terrain exists well forward near the boundary.

Innovations

It is no longer accepted doctrine to plan for the hasty withdrawal of friendly forces in the face of hordes of enemy tanks at the outbreak of hostilities. On the contrary, recent reorganizations and introduction of new equipment to the European Theater enable us to hold ground well forward, defend decisively and, where possible, attack!

For example, armored cavalry squadrons are now considerably more than pure reconnaissance forces. They possess significant tank-killing ability with their fifty-four M551 Sheridans. Early installation of the laser rangefinder will further improve this system. TOW missiles organic to infantry battalions can successfully engage and kill tanks at 3000 meters, and introduction of the DRAGON missile system will significantly increase our antiarmor capability. Divisions now also have organic air defense battalions; in the 3d Infantry "Marne" Division, the feasibility of an organic tank-killing aviation battalion is being tested. Introduction of the M60A2 tank and add-on stabilization for the M60A1 will vastly improve first-round hit probability while on the move. Many direct support 155-mm self-propelled howitzer battalions have replaced their M109 howitzers (range 14,600 meters) with the improved M109A1 (range 18,000 meters). Recent successful test firings of the cannon launched guided projectile from that weapon promise revolutionary improvement of field artillery's tank-killing ability in the not-too-distant future.

These firepower innovations, coupled with the proximity of allied forces to the boundary, make it highly unlikely that the initial covering force will operate in the traditional sense. More likely, it will be disposed relatively close to the main defense and will be required to inflict heavy casualties upon the enemy for a longer period of time than previously envisioned.

Positioning

The existence of an international boundary between forces has a significant impact upon the positioning of artillery, certainly for the first few days of hostilities. For one thing, permission to place defensive fires across the international boundary will probably not be granted until after a clear-cut initiation of hostilities.

by LTC Ronald B. Stevens

FA Supports



Division Covering Force

In the defense, a rule of thumb for positioning field artillery has always been that batteries are generally placed one-third their range on the friendly side of the forward edge of the battle area (FEBA). Assuming the international boundary as the initial FEBA, and permission not readily available to fire across the boundary, two-thirds of the range of our artillery would be wasted if batteries were positioned conventionally. So, placing our batteries generally two-thirds of their range behind the boundary would provide depth to the defense, accurate fires where they are needed adjacent to the boundary and continuous support of covering forces if they withdraw. Further, such positioning would enable direct support battalions to be immediately responsive to the brigades they support upon withdrawal of covering forces.

With two brigades committed to the forward defense and one in reserve, adequate organic artillery support exists to provide one direct support battalion to each brigade in the forward defense area and one in direct support of the covering force. An 8-inch howitzer battery positioned and tasked to reinforce the covering force direct support battalion provides a mixture of calibers. Positioning of attached or supporting corps 175-mm gun units to provide similar fires would further enhance deception. In this situation it really matters little, from a practical viewpoint, whether the direct support battalion is attached to the covering force or not. Direct support battalions would still be available to committed brigades as the covering force withdraws. The battalion supporting the covering force logically would reinforce the fires for the most dangerous sector after passage of lines, and the reinforcing 8-inch howitzer battery would revert to its parent unit's control in a general support role. In this instance, the direct support or attached field artillery battalion commander would be responsible for fire support coordination for the covering force.

Support problems coincidental to the employment of a separate covering force over and above three *committed* brigades were adequately demonstrated to the 3d Infantry "Marne" Division Artillery during the conduct of REFORGER in October 1973. In that instance an *ad hoc* division covering force was provided under the leadership of an available, highly-competent infantry colonel. All his assets, personnel and materiel, were scrounged, including his immediate staff. With his force and three brigades committed, inadequate organic combat and combat service support facilities existed to support the four major subordinate commands. In the case of the field artillery, the battalion which was normally one brigade's direct support was attached to the covering force to withdraw through the main force and the attached 155 battalion to revert to its direct support



Soviet BMP-76.

mission. Those not familiar with field artillery organization did not understand why the battalion could not switch from attachment to one major subordinate command to direct support of another and provide immediate fire support in the bargain. The facts were, of course, that all forward observers and fire support officers were with the covering force and required as much as three to four hours to locate their new units and become familiar with their plan of defense. To aggravate matters, when the covering force withdrew, it became the division reserve. Its subsequent commitment in offensive operations placed a reverse demand on artillery support — with similar chaotic effect.

When it is necessary that all three brigades occupy the forward defense area because of the width of the division sector, support of the covering force becomes more difficult and techniques must be less traditional. The 3d Infantry Division has concluded that, in this instance, the covering force is best provided individually by the three brigades. The three organic direct support battalions then would be available to support the covering force and their respective brigades upon withdrawal of the covering force. The three 8-inch batteries of the divisional general support battalion might well individually reinforce the three direct support battalions and regroup only after withdrawal of the covering force; an alternative is to supplement their fires with those of corps 8-inch battalions. Careful positioning of the 155 battalions with their new 18,000-meter range capability might even allow them to support the covering force from initial defensive positions. With the range of the 8-inch howitzer now being nearly the same as the 155-mm, these weapons systems would be positioned similarly. Fire support coordination would be accomplished by the three direct support battalions within their individual sectors. Firing laterally across the interior brigade boundaries would be accomplished by coordination between brigade fire support officers. Division artillery headquarters

would assist when appropriate with additional fire support assets not available to the direct support battalions.

Suppressive Fire Support

The 3d Infantry Division Artillery recognizes the suppression of the enemy's direct fire weapons as its principal mission in support of both the covering force and main defense. With the enemy's weapons suppressed, the division's own direct fire weapons may then take his armored vehicles under killing fire. Moreover, suppressive indirect fires, if applied with surprise, may themselves kill the crews of armored vehicles which are not yet buttoned up. Accordingly, although other shell and fuze combinations may be used, responsiveness and surprise are enhanced by prescribing standard shell and fuze combinations, such as HE/VT for 155-mm battalions and HE/Q for 8-inch battalions. Continued firing with improved conventional munitions (ICM) and white phosphorous would then maximize lethality among accompanying infantry.

Direct support battalions at all times should know the location and type of all fire units that are in position to fire on preplanned targets within the direct support battalion's sector. Priorities and updated target information should be provided to these fire units by the direct support battalion fire direction center (FDC). If the direct support battalion FDC receives a fire mission that merits all available fire, it can then call for fire from not only its own and reinforcing units, but also units in adjacent brigade sectors. If the adjacent units are not committed to another mission, they should be required to acknowledge and fire the requested mission.

Dedicated Battery

Immediate suppressive fires will often be required in fluid situations when the enemy takes friendly maneuver elements under fire from areas where friendly suppressive fires have not been preplanned. The dedicated battery is a new technique which would increase responsiveness in such situations. The covering force commander would determine which subordinate force might require a dedicated battery.

This is an extension of the direct support mission, and the direct support battalion commander would still have the inherent responsibility of the direct support role — that is, support of the entire brigade. For the concept to work effectively, without detracting from the support of other elements of the brigade, at least one battery of the direct support battalion and all reinforcing battalions would remain free of dedicated status. The dedicated battery fire direction officer would anticipate operational requirements by closely monitoring the frequency of the supported

maneuver unit. The knowledge gained by listening to the maneuver command net would enable him to change the designation of priority targets as the battle progresses. This technique is essentially a quick-fire channel directly from maneuver unit soldiers.


Batteries should be dedicated for brief periods of time (normally not more than 24 hours) or for a specific phase of the operation. The maneuver and field artillery commander must agree on the length of time the battery is to be dedicated. Whether in dedicated status or not, each battery should lay on a priority target when not engaged in a fire mission. Data should be sent to the gun sections who would prepare rounds but not load. Requests for immediate suppressive fire would be fired instantaneously — rounds in the air within 30 seconds.

Withdrawal

In those cases where the covering force is a great distance forward of the main force, so that supporting artillery must withdraw through the covered force, detailed and centralized planning and execution will be necessary. A special problem is that, although tanks can approach the covered force with gun tubes pointing to the rear, field artillery self-propelled weapons are designed to be pointed toward the main force as they approach it. This makes them easily mistaken for attacking enemy tanks. Uniformity of recognition symbols and coordination of passage points are therefore essential. In this regard, one standard color identifier should be used, whether flag, smoke or pyrotechnic. It is especially critical that junior leaders personally coordinate the passage ahead of time and, when possible, rehearse this difficult operation.

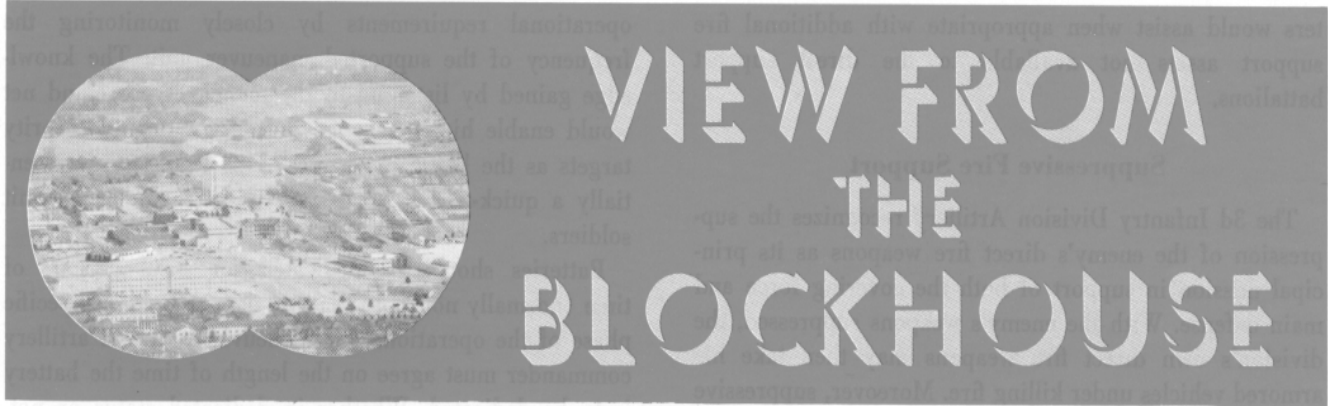
To insure continued support of the covering force, all batteries of direct support battalions, whether in dedicated status or not, must maintain the capability to split into halves and move by bounds (leapfrog).

Conclusion

The tactics and techniques discussed here capitalize upon the field artillery fire support currently available to the covering force commander. If employed skillfully, they can kill tanks, strip armored formations of their accompanying infantry, deceive the enemy commander and maximize the supported commander's opportunities for success. 

LTC Ronald B. Stevens, FA, is Commander of the 2d Battalion (155-mm SP), 41st Field Artillery, Bad Kissingen, Germany.

Notes from the School



Close Support Study Group

MG David E. Ott, Commandant, USAFAS, at the direction of the TRADOC commander, formed the Close Support Study Group on 29 July 1975. The study group, under COL Paul F. Pearson, Director of the Gunnery Department at USAFAS, was given the mission of "optimizing observed fire support for maneuver forces on the modern battlefield." Members of the study group included representatives from the Infantry School, the Armor School, the Combined Arms Combat Development Activity, MASSTER and USAFAS.

The group's initial draft report on 12 September 1975 recommended a number of major changes in the Army's observed-fire system. Some of these are:

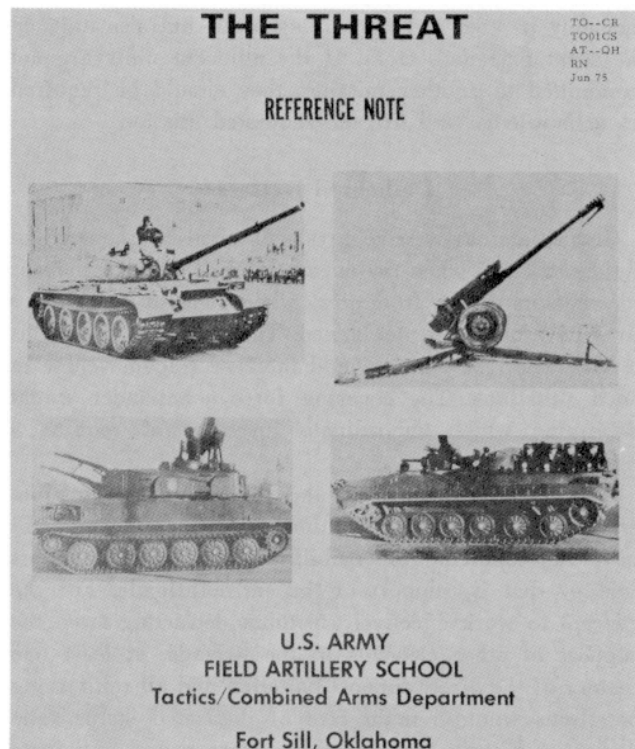
- Provision of a fire support officer (FSO) for the maneuver company commander.
- Integration of mortar and field artillery observer assets into a fire support team (FIST) at company level.
- Assignment of the FIST to the maneuver company.
- Creation of a new MOS (13F) for enlisted men who work with maneuver forces as observers and liaison/fire support specialists.
- Single-source training for these 13F personnel, with all formal schooling accomplished at USAFAS.
- Assignment of FA fire support sections with the FSOs to maneuver battalions and brigades.
- Development of a very close, full-time, continuous working relationship at each level between FA and maneuver forces. This increased emphasis on combined-arms training and operations would be facilitated by having an FSO/fire support expert at each maneuver level and by making the direct support battalion commander responsible for coordinating and supervising all technical fire support training within the maneuver brigade.
- Addition of specific fire-support requirements, to include some live-fire missions, in maneuver company and battalion Army Training and Evaluation Programs (ARTEPs).

These recommendations, along with many others contained in the draft report, are being staffed at the affected service schools at the time of this writing.

Unclassified Threat Publications

Several unclassified publications on a "real" world threat are now being used for resident instruction. Additional literature will be available by the end of the year for nonresident instruction and field training.

The Aggressor Order of Battle manuals (FM 30-102 and FM 30-103) have been replaced within the School by a reference note on "The Threat." This publication will be used by students during map exercises to "play"



View From The Blockhouse

the threat force. The maneuver, fire support and target acquisition organizations and tactics contained in the reference note describe the type of threat force that would be encountered on the modern European battlefield.

A training circular (TC 6-4-1) on the threat and the Field Artillery's role in defeating it will be published by the end of the year. It is designed for use at battalion and battery levels. The TC illustrates offensive and defensive tactics, identifies vulnerabilities and weaknesses of the threat force, lists specific tactics a field artillery unit can use to defeat the threat and provides tips for threat training.

A correspondence course (Subcourse 420, "The Battlefield Threat") will be ready for issue by the end of the year. The three-credit subcourse includes a 40-question exam on the same material covered in the threat reference note and TC. These three publications use the same data base, assembled through extensive research of unclassified US and foreign publications.



FA Emblem

These emblems have been selected to honor the 200th Anniversary of Field Artillery. The design was approved by MG David E. Ott, Commandant, USAFAS. The premiere appearance of the emblems was made at the FA 200th Anniversary Ball held in Washington, DC, in November. These designs will be seen throughout the American Bicentennial observance. Projected uses for the emblems may include casting a commemorative coin. Additional information will be made available to *Journal* readers.

New FAOBC

The Officer Basic Course (OBC) has been completely redesigned and will have an entirely new configuration beginning next fiscal year. The new OBC will be a two-phase program consisting of five separate but related courses.

Phase I, a 10-week course entitled the Field Artillery Officer Basic Course, will be attended by officers normally trained in OBC. The thrust of this course is on the fundamental skills needed by a field artillery officer to perform effectively as a forward observer and a battery fire

direction officer. The course will also familiarize students with the duties of the battery executive officer. Major subject areas covered include observed fire, fire direction, the threat, target acquisition/survey, firing battery, maintenance, communication equipment and codes, combined arms team and FA tactics and fire planning.

Phase II consists of four functional courses designed to train Active Army students for their first duty assignments. Each student will attend the functional course that corresponds to his initial unit of assignment.

- Officers assigned to cannon units will attend the seven-week, three-day Cannon Battery Officer Course. This course will polish the skills acquired in OBC and will emphasize responsiveness and survivability of the field artillery system, to include duties of the XO, attack of targets, combined arms maneuver tactics, maintenance and nuclear safety.

- Subsequent to attending the 10-week OBC, students being assigned to FA missile units will attend either the Lance Officer Course (four weeks, three days) or the Pershing Officer Course (seven weeks, one day). These courses will produce qualified missile battery officers through training on the hardware, operation, employment, positioning and transportation of each missile system. Currently in existence, these courses will be scheduled after OBC classes.

- The combined Target Acquisition/Survey Officer Course (nine weeks, four days) will be attended by those officers being assigned to survey duties or target acquisition units. The scope of this course includes the planning for target acquisition and employment of target acquisition systems; also included are processing and dissemination of target intelligence, survey operations and the production of meteorological data. An officer dually qualified to perform survey and target acquisition duties will be the product of this course.

Mitchell Safety Device Modified

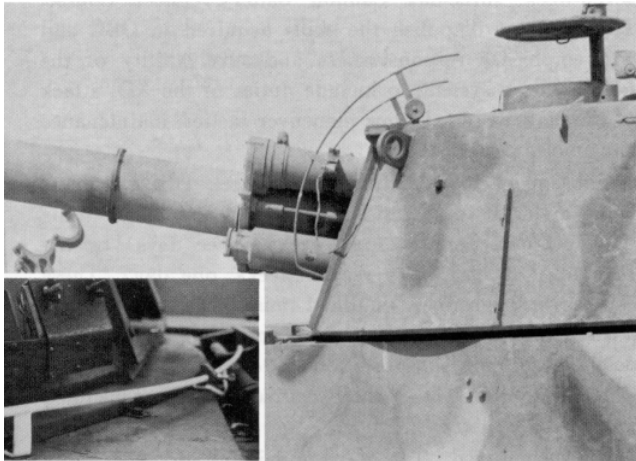
To the doubtful enthusiasm of M109 and M109A1 crews, the Mitchell Safety Device ("View From the Blockhouse," May-June 1975 *Journal*) honks louder than ever following recent modification by the School's Weapons Department. The system has been redesigned around two militarized microswitches: one installed on the track fixture mounting bracket and the other on a bracket extending from the upper recoil cylinder. Each microswitch is electrically wired between the power pack solenoid and the cab power switch box.

Small mechanical stops (replacing the "C" clamps of the previous version) are set on metal rods at Quadrant

View From The Blockhouse

Elevation (QE) and deflection safety limits. Thus, as the tube or cab is moved beyond safety limits a microswitch is tripped by one of the stops. This results in the familiar embarrassing horn blast and total failure of all turret power. The cab remains without power until it is manually traversed back to the safety limits.

For a visual check of QE the stops and the elevation microswitch arm are painted in contrasting colors and an arrow is painted on the offset periscope cover on the right side of the tube. The plexiglass arc of the early model has been discontinued.



Militarized microswitches are tripped by pre-set mechanical stops when quadrant elevation or deflection safety limits are violated. Note Plexiglass arc of earlier version has been eliminated.

Deflection is visually indicated by aligning adhesive tape at deflection safety limits on the sides of the vehicle's turret and hull.

There are 45 sets of materiel on order to build devices for III Corps and USAFAS units for field testing. Materiel has been received and 18 sets are now being constructed. Six of the 18 will be sent to the 1st Cav, six to the 4th MECH and six to III Corps Artillery units for evaluation. When actual requirements for the device are firmly established, TSA (Training Support Activity) will assign production of the system to a contractor, AMC (Army Materiel Command) or one or more of the TASOs. The cost of the entire system is estimated at less than \$100 if produced at TASO facilities.

13E "Report Cards"

The Gunnery Department is now issuing academic achievement reports on its 13E AIT students. A letter is being placed in each graduate's records file, addressed to the individual's first unit commander, giving a comprehensive picture of how well the soldier did in the gunnery portion of AIT. The letter shows the grades

attained by the student in each major block of the course; e.g., registrations, met, FADAC, etc., and his final overall grade. A detailed listing of the specific subjects covered in each major block is also provided. This will allow the unit commander to see at a glance which skills a newly-graduated 13E has satisfactorily acquired and in which subjects he is obviously weak. This information will aid the commander in planning a training program to increase the soldier's proficiency in weak areas or to teach him procedures which were not covered in AIT. The end result should be less time wasted and motion expended in qualifying the AIT graduate to be a productive member of the unit FDC.

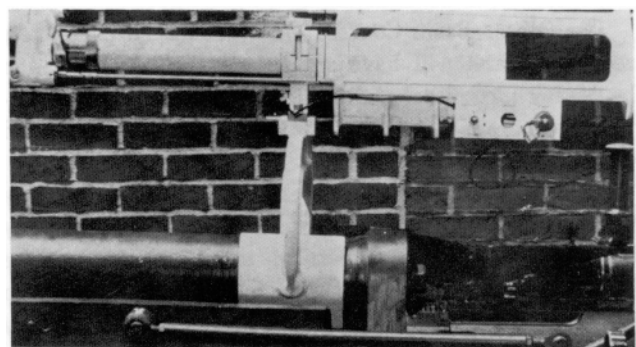
Direct Fire Trainer

Nothing is more certain to ruin a gunner's day than the sudden appearance of an enemy tank on the horizon. In response to the vulnerability of field artillery in a heavy armor environment the School's Department of Doctrine and Training Development recently unveiled a prototype artillery direct fire trainer (ADFT).

The trainer is a modification of the M55 LASER device used by the Armor branch for direct fire training. Since an artillery projectile travels slower than its armor counterpart, the M55 has been altered for larger elevation and lead angles.

On the range the field artillery gunner engages a moving target pulled in a 1/4-ton trailer with a LASER beam. The device utilizes a 1/10th scale range so that actual training ranges of 40 to 160 meters correspond to battlefield ranges of 400 to 1600 meters. A successful engagement is apparent when the gunner adjusts to correct lead and elevation and scores a hit on the highly reflective target.

The US Army Field Artillery Board is conducting Operational Test II of the device at Fort Still. Current schedules predict initial distribution in August 1977 of



Modified M55 LASER provides new direct fire training capability on small ranges.

View From The Blockhouse

one trainer for every 105- and 155-mm field artillery battalion, both active and reserve.



The "target"—line drawing on reflective background, towed downrange in a ¼-ton trailer.

AR 50-5 And You

"What does AR 50-5 mean to me?" This might be your first question after reading the above title. As the time-worn cliché goes, "It depends upon your situation." AR 50-5 deals with the Army's Nuclear Surety Program (NSP) and is used as a basis to determine the reliability and stability of those Army personnel assigned to nuclear duty positions, both weaponry and reactor assignments. Of course, we in the Field Artillery are interested in the weaponry aspects. Compliance with AR 50-5 is a prerequisite for enrollment in certain courses taught at USAFAS. If you or one of your personnel receives orders to attend one of these courses, the regulation requires that certain actions be taken prior to reporting to USAFAS. Those personnel assigned to or trained for nuclear duty positions must be screened and evaluated for reliability; DA Form 3180 (Personnel Screening and Evaluation Record) is used for this purpose. This form must be completed through Part IV prior to arrival at USAFAS.

In the past year, the number of personnel reporting to USAFAS without the required DA Form 3180 has increased. As an example, of the 26 officers in a recent Pershing Officer Course, 16 (62 percent) did not have a completed DA Form 3180 in their Military Personnel Records Jacket (MPRJ). Special instructions in the assignment orders should state, "AR 50-5 applies. DA Form 3180 must be completed through Part IV prior to arrival at USAFAS." However, these special instructions are not always included in the assignment orders. We are attacking this problem through channels, but it may take some time to solve it. In cases where students report in without a properly executed DA Form 3180, one of three actions normally occurs:

1) The student misses some instruction while awaiting

evaluation and may not be as well qualified as one who attends all instruction.

2) The student may be denied enrollment and be held at USAFAS for attendance with a subsequent class. In this case, he will be late arriving at his next duty station.

3) The student may be denied enrollment and be:

a. Returned to his parent unit (if TDY to the course) without receiving the schooling.

b. Reassigned to another unit where the specialized schooling is not required.

c. Shipped on to his unit of assignment without receiving the schooling.

This means that commanders in the field may not receive timely, school-trained replacement personnel. Therefore, if you or any of your personnel are to be assigned to nuclear duty positions, it behooves you to become familiar with AR 50-5 and the USAFAS courses to which it applies. Those courses are as follows:

1) Lance Officer Course (2F-1190L).

2) Pershing Officer Course (2F-1190P).

3) Eight-Inch Atomic Projectile Assembly Course (Officer), (4F-F5).

4) Eight-Inch Atomic Projectile Assembly Course (Enlisted), (041-F2).

5) Pershing Laying Specialist Course (043-15E30).

6) Pershing System Maintenance Course (Warrant Officer), (4F-214E).

7) Pershing System Maintenance Course (Enlisted), (121-21G20).

8) Pershing Communication Specialist Course (101-31D20).

9) Field Artillery Missile NCO Basic Course (0-15C40).

10) Field Artillery Missile NCO Advanced Course (0-15C42).

When an individual not currently in the NSP receives orders to any of these courses, it is the responsibility of the immediate commander to comply with AR 50-5 and initiate DA Form 3180. For those individuals currently in the NSP, a new form is not required.

Three basic steps are required to execute DA Form 3180 and are detailed in chapter 3, AR 50-5. Briefly, the steps encompass screening the personnel records, screening the medical records and, finally, interviewing and briefing by the commander. The purpose of completing DA Form 3180 is to discover whether disqualifying factors may be present. Once completed, DA Form 3180 is placed in the individual's MPRJ.

What does AR 50-5 mean to you now? With this brief synopsis of the requirements set forth in AR 50-5, we hope it means that the students sent to USAFAS meet those prerequisites so that timely, highly-qualified replacement personnel can be provided.



by MAJ Jean Reed

On the modern battlefield the field artillery must provide fires in support of the maneuver force better than ever. Many changes in doctrine and organization have been discussed in the *Field Artillery Journal* during the past year: changes in gunnery procedures to reduce response time; streamlining fire support planning and coordination procedures; assignment of target acquisition batteries to the division artillery; and, new operational techniques to improve the survivability and capability of the howitzer battery. Many of these changes are being incorporated in new training circulars written at the Field Artillery School. Materiel developments to improve the operational effectiveness of the field artillery are in varying stages. Some are in production and soon will be issued to the field; other materiel is in advanced or engineering development; and other materiel has only reached the concept stage — a glimmer in the eyes of the materiel developer and the combat developer.

New materiel result in new concepts and methods of use, which in turn result in new organizations. Shortcomings in operational capability, when considered in light of the threat expected on the battlefield, drive requirements for new doctrine, new organizations and new materiel. The combat and materiel development cycle in unending. Testing is required throughout the development cycle to insure that the operational effectiveness of the Army is increased. Testing early in the development cycle may identify materiel or operational concepts of limited usefulness which should not be pursued or may permit early identification of promising concepts which should be followed-up. This is the objective of the HELBAT (Human Engineering Laboratory Battalion Artillery Tests) series, a continuing program of field artillery studies, tests and field experiments

involving the Field Artillery School, Army Materiel Command's Human Engineering Laboratory and other elements of the development community. These elements combine resources in investigation of the feasibility, practicality and usefulness of various approaches to solutions for problems of interest to field artillery, early in the development cycle. HELBAT is the Field Artillery School's test bed for the evaluation of conceptual operational doctrine, procedures and materiel.

The HELBAT series began in 1969 as an exploratory study by the Human Engineering Laboratory to measure the frequency, source and magnitude of human error in the Field Artillery System. From that beginning, the series (now with USAFAS as a cosponsor) has evolved into an investigation of conceptual materiel and doctrine to reduce FA system reaction time, improve our ability to attack moving and stationary targets and achieve first round fire-for-effect. There have been five experiments in the series to date. The results of the first four experiments were discussed in a previous edition of the *Field Artillery Journal* ("HELBAT Connects," May-June 1974). HELBAT 5 was completed at Fort Sill in June 1975.

As reported earlier, HELBAT 4 demonstrated the capability to predict target locations accurately and to fire on them quickly. A closed loop fire control system, in which an observer's laser rangefinder was data-linked to a modern battery level fire direction computer, was used. The system solved for target location; predicted a new location based on target velocity, gun crew reaction time and time of flight; computed firing data to that

point; and displayed the firing data automatically at the howitzer sections.

In December 1973, the Field Artillery School proposed that the series continue and Army Materiel Command concurred. Human Engineering Laboratory and USAFAS project officers felt that a subsequent experiment should test and develop further the operational fire direction techniques demonstrated in HELBAT 4; should investigate the capability of automated technical fire control techniques to reduce errors and improve response times in various elements of the FA system, providing data on the degree of automation necessary and desirable in that system; could field test several technical fire control concepts to more accurately determine future field artillery required operational capabilities; and could provide experimental data on FA system accuracy and response time for use in field artillery studies in support of materiel, doctrinal and organizational requirements. As approved by USAFAS and Army Materiel Command, HELBAT 5 would develop further and verify the fire direction techniques used in HELBAT 4 (utilizing the lessons learned in that test) and would investigate further improvements in computer software, hardware and gunnery procedures required to reduce FA system response time and improve system accuracy. HELBAT 5 would investigate the use of adjustment versus predicted fire techniques in the attack of moving and stationary targets, and registration and adjustment techniques using the laser rangefinder ("The Laser Rangefinder," September-October 1975 *Journal*). It also would investigate use of multiple observers on a single moving target, engagement of multiple targets simultaneously with elements



of the same battery and further refinement of the observer location techniques used in HELBAT 2 and HELBAT 4, and would measure firing section error to establish a baseline against which to compare the effects of automated gunlaying which might be used in later experiments.

Preparation

Two tests were conducted in preparation for HELBAT 5. The Firing Battery Accuracy Assessment Program, conducted May-December 1974 at Fort Sill, established that significant errors were occurring in the firing section with an unexpected frequency ("Forward Observations," May-June 1975 *Journal*); this had been indicated in analysis of HELBAT 4 results. The Cannon Artillery First Round Accuracy Assessment (CAFRAA), conducted in December 1974, evaluated the capability of the FA system to provide effective first round fire-for-effect on a target using current materiel and fire direction procedures without adjustment. The results were to furnish a portion of the baseline data against which the improvements sought in HELBAT 5 could be measured. MAJ John A. Nilsson, Test and Experimentation Division, ODACCD, USAFAS, was the test officer for both evaluations.

Support

As detailed planning for HELBAT 5 progressed, the 3d Battalion, 18th Field Artillery (a III Corps Artillery 155-mm SP battalion), was selected to support the test. The battalion committed one howitzer battery (Battery B, commanded by CPT David Allbee) and elements of the headquarters battery for approximately two months in training for and conduct of the test. Selected forward observer (FO) and fire direction personnel also were provided by 212th Field Artillery Group. Test team support (in addition to the nucleus provided by Human Engineering Laboratory, Frankford Arsenal and the School's Department of Combat Developments) was provided by the Field Artillery Board; Company B, 40th Armor; 151st Ordnance Detachment; Gunnery, Target Acquisition and Weapons Departments; Battery C, 25th Target Acquisition Battalion; Armaments Command; Missile Command; and Electronics Command. The player battery was equipped with three M102 howitzers and one M109 howitzer for the experiment and fired approximately 3,000 rounds of mixed 105-mm and 155-mm ammunition.

Gunnery System

The gunnery system used in HELBAT 5 incorporated the elements of the FA system required to achieve

Figure 2—AN/GVS-5 handheld laser rangefinder mounted in viscous-damped light-weight tracking mount and adapted for remote readout and transmission of distance, direction and vertical angle (from observer to target) to the HELBAT 5 FDC.

accurate first round fire-for-effect on the target. Three computer systems were used: the current field artillery digital computer FADAC in the standard FDC (used to obtain baseline data on current system effectiveness using the new gunnery techniques published in TC 6-40-1, "Modern Battlefield Gunnery Techniques"); Frankford Arsenal's computer test bed with firing section data displays (previously tested against FADAC and the British Field Artillery Computer Equipment, "View from the Blockhouse," March-April 1975 *Journal*) to provide a representation of a fourth generation battery computer in the standard FDC; and, the HELBAT computer (used in HELBAT 4) with updated computer software linked to individual firing data displays at the howitzer sections. The HELBAT computer would automatically process the missions shown in figure 1.

Figure 1

HELBAT 5 Automated FDC Operations

Registration

Observer location using laser rangefinder data

Attack of stationery targets with
adjustment fire-for-effect without
adjustment

Attack of moving targets with adjustment
continuous fire-for-effect

Multiple observers: attack of one moving target using data
from two observers

Multiple missions: attack of two separate moving or
stationary targets simultaneously

New Items

Other new items of experimental hardware were introduced. The AN/GVS-5 handheld laser rangefinder, to be issued to the field artillery in a tripod-mounted configuration, was adapted for tracking moving targets and for automatic readout of direction, distance and vertical angle to the data-linked HELBAT computer, just as the Ground Laser Locator Designator was used in HELBAT 4 and again in HELBAT 5 (see figure 2).



This permitted an evaluation of the capability of the AN/GVS-5 to be used as a "precision target locator."

A gun laying error measurement system was fabricated and mounted on the panoramic telescope and the range quadrant of the base piece used during the test. This system (figure 3) permitted a data collector to measure gun crew performance in real time during the experiment without interfering with crew operations. The system worked quite well and showed great promise for use as a firing battery training system, gun safety system eliminating the requirement for safety officers or even as an element of a semiautomatic gun laying system.

Two commercial muzzle velocity radars or velocimeters were compared to the M36 chronograph, determining their capability to provide accurate muzzle velocity data for use in the gunnery problem in delivery of predicted fire. This evaluation was conducted by the Field Artillery Board for the School by satelliting on HELBAT 5 and on other tests and service practices in progress at Fort Sill.

Additionally, the distance of the meteorological station from the firing site in HELBAT 4 was thought to have been a major source of error in the firing accuracies obtained in that experiment. Even though firing accuracies in HELBAT 4 were significantly better than had been measured in HELBAT 3, accuracy of meteorological data was an area of major concern. The Field Artillery Board located a metro station at a site representative of the separation of a division artillery metro station from the center battery of the center direct support battalion (approximately eight km). During the first week of the test quality control and comparison meteorological flights were launched from a site beneath the maximum ordinate of the downrange trajectory by a team from the Target Acquisition Department. The metro data obtained at both sites compared favorably.

Data Collection

The data collection program in HELBAT 5 was even more extensive than that of HELBAT 4. Test controllers (in both standard and automated FDCs, with the observer teams, in the firing battery, in the control center, with the flash base and with the AN/TPS-58 moving target radar) measured response times, recorded weapon settings, noted errors made or not made, measured target locations and recorded fall-of-shot location. Firing data were updated by frequent recomputation of muzzle velocity measured with the chronographs and with frequent meteorological messages. Data from the test are now being reduced at the Human Engineering Laboratory and at the Field Artillery School.

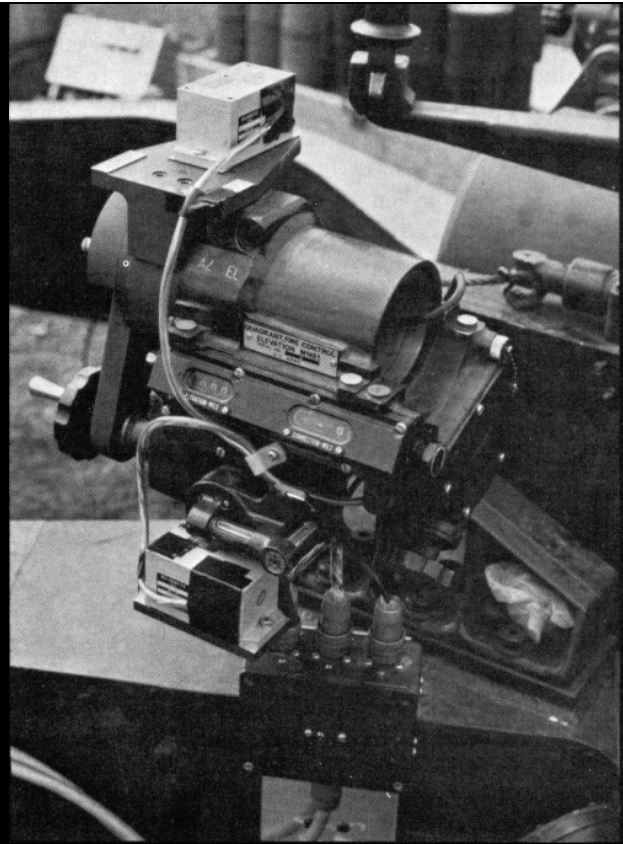


Figure 3—Gun laying error measuring system mounted on assistant gunner's range quadrant provided remote readout of accuracy of quadrant set and leveling of elevation and cross-level bubbles.

Results

Emerging results from the test are most encouraging.

The rate of gun laying errors measured with the error measurement system for howitzer crews using firing section data displays was 10 percent — versus the 25 percent error rate established for conventional procedures in the Firing Battery Accuracy Measurement Program.

Against stationary targets CAFRAA achieved first round fire-for-effect accuracy of 54 meters mean radial error for transfers using registration data under very closely controlled conditions. In HELBAT 5 the automated FDC achieved comparable results for the closed loop fire control system. Data from the standard FDC using FADAC and the Frankford-Arsenal test bed is still being analyzed. Response times for all systems were significantly shorter than for HELBAT 4. Against targets moving cross-country, the standard FDC using FADAC confirmed the results of HELBAT 4 — achieving a mean radial error of approximately 460 meters. The automated system demonstrated a very high degree of

accuracy in the delivery of highly responsive fires against moving targets. Direct hits on the target tanks were obtained on three occasions. In summary, the results for the attack of moving targets using an automated closed loop fire control system for HELBAT 4 demonstrated a two-fold improvement in accuracy and response time over HELBAT 3, and HELBAT 5 demonstrated a two-to three-fold improvement over the results of HELBAT 4. The system demonstrated the capability for accurate and virtually continuous fire on a moving target by updating firing orders just as rapidly as the guns can be loaded and fired (see photo, page 51).

The test methodology established by Human Engineering Laboratory in HELBAT 1 has been applied in succeeding series tests. In HELBAT 1, Human Engineering Laboratory identified and quantified source of human error in the FA system, then set about to eliminate these errors systematically through the use of new procedural or materiel concepts. Thus, the test series has been highly derivative in nature, with the result analyses of one test furnishing the bases on which succeeding tests are founded. As a consequence, tests have been conducted approximately every 18 months since the program began — the time required to analyze the results, formulate objectives for the following test, obtain funds and then prepare for the test. The result is a test series which has given excellent return for dollars invested in terms of validation of new procedures and materiel concepts.

Following HELBAT 4 it has been possible to identify a number of conceptual improvements in the FA system, some of which require longer lead time hardware for continued and progressive evaluation than in earlier experiments. An excellent example of such an improvement is the application of higher levels of automation in the howitzer section. In HELBAT 4 the FA gunnery system was automated from the FO to display of firing data at the gun section, resulting in a significant reduction in system response time. The question now becomes, "What payoff in terms of further reduction in response time and increase in accuracy will result from application of automation to the firing section?" Several levels of automation have been identified: automatic setting of firing data, automatic leveling of weapon sights, automatic traversing and elevation of the howitzer and, finally, automatic loading of ammunition. The previous application of automation resulted in a reduction of system response time from 15 minutes to less than two minutes. Now we speak of reducing the 25-second response time of the firing section. Increased accuracy


HELBAT 5 firing battery area showing M36 chronograph, gun laying error measurement system, velocimeter, firing section data display, AN/GVS-5 laser rangefinder in tracking mount. Data collection station is at left rear. Three M102 howitzers and one M109 howitzer were in the firing battery.



is expected also. The questions to be answered are: "What is technically feasible?" "What is practical in terms of degree of improvement?" "What is affordable?" Through the approach discussed here, the Field Artillery School and the materiel development community will get the experimental data needed to make a reasoned decision on automation requirements.

For such a course of investigation to be accomplished efficiently and in a reasonably brief time, a continuing experimentation program is required — rather than the incremental program that was used in HELBATs 1 through 4. The program has been put on a continuing basis in the Field Artillery School and TRADOC through establishment of a USAFAS HELBAT Steering Group and use of the Department of the Army Five Year Test Program. A continuing Army Materiel Command program, with Human Engineering Laboratory as lead laboratory, has been approved and an AMC/TRADOC HELBAT Executive Committee has been formed to provide high level technical and policy review of the program.

planned for two phases: Phase I to investigate firing battery operations during early 1976 and Phase II to continue investigations in closed loop fire control in the fall of 1976. Phase I will examine firing battery laying and referring systems, further improvements in gun data displays, intra-battery communications, an advanced gun laying error measurement system and, possibly, a semi-automated howitzer sight system. Investigated in Phase II will be a closed loop fire control system linking target acquisition devices, the digital message device and battalion TACFIRE. A battery computer and gun data displays will be assembled to permit examination of interface requirements and operational concepts for the system in light of proposed TACFIRE and cannon launched guided projectile doctrine for technical fire direction. If it can be made available, a conceptual FO vehicle also will be tested.

The FA School's test bed for conceptual operational doctrine, procedures and materiel is continuing to provide experimental field data in support of field artillery combat and materiel development. 

HELBAT 6

Planning for HELBAT 6 is underway. The test is

MAJ Jean Reed, FA, is chief of the Doctrine Development Team, DTD; and served as the HELBAT 5 project officer.

Commanders Update

BG Robert B. Hankins
56th Field Artillery Brigade

LTC Richard Roundsville
2d Battalion, 21st Field Artillery

LTC Jerry W. Childers
25th Aviation Battalion

LTC Marc A. Cisneros
1st Battalion, 3d Field Artillery

LTC Charles L. Williams III
1st Battalion, 30th Field Artillery

LTC Ellis D. Parker
82d Aviation Battalion

LTC John L. Gardella
2d Battalion, 4th Field Artillery

LTC Harold Baumeister
6th Battalion, 33d Field Artillery

LTC Roland Holmstrom
2d Training Battalion, Fort Sill, OK

LTC Robert A. Cooper
2d Battalion, 5th Field Artillery

LTC Richard O. Roemer
6th Battalion, 37th Field Artillery

LTC Frederic Stubbs
3d Training Battalion, Fort Sill, OK

LTC Jamo C. Powell
2d Battalion, 6th Field Artillery

LTC Michael Mosbrooker
1st Battalion, 76th Field Artillery

LTC James Bolin
4th Training Battalion, Fort Sill, OK

LTC J. H. Binford Peay III
2d Battalion, 11th Field Artillery

LTC Kevin J. O'Neil
1st Battalion, 79th Field Artillery

LTC Richard Skowronek
5th Training Battalion, Fort Sill, OK

LTC Roderick Carmichael
1st Battalion, 13th Field Artillery

LTC William W. Breen
6th Battalion, 80th Field Artillery

LTC William Fraase
3d Battalion, 2d Training Brigade
Fort Leonard Wood, MO

LTC Charles C. Mitchell
6th Battalion, 14th Field Artillery

LTC Stanley Zagalak
1st Battalion, 81st Field Artillery

LTC Dudley L. Tademy
2d Battalion, 3d Training Brigade
Fort Dix, NJ

LTC William A. Warnock
1st Battalion, 15th Field Artillery

LTC Cassius Mullen
1st Battalion, 333d Field Artillery

1-12th FA Sets Sail

The 1st Battalion (Lance), 12th Field Artillery, set sail on Lake Elmer Thomas (north of Fort Sill) on its recent return from a live fire exercise at White Sands Missile Range, NM. Few of the men got their toes wet, however, during the entire two-day swimming and airlift exercises — only one of many training activities scheduled for the unit in the next 12 months.

The battalion assumed a US Army Strategic Forces status and transferred to FORSCOM in September 1975. Scheduled Operational Readiness Training Tests and Technical Proficiency Inspections will require the battalion to demonstrate the reconnaissance, selection and occupation of position; survey; communication; and "shoot and scoot" capabilities necessary for "combat ready" certification.

The men of the unit will also continue to support 10 Lance NCO and five officer courses at USAFAS as well as participate in Phase I of the non-nuclear Lance Developmental Test III. During the test the warhead will be unpacked, mated and unmated 10 times (simulating 20 firings) and will travel about 200 miles in various vehicular configurations.

The battalion will fire 14 live missiles from White Sands Missile Range. These missiles are new materiel flight tests, stockpile flight tests, developmental tests and Annual Service Practice rounds. Assembly and firing sequence procedures will be graded by the experts of the Field Artillery Missile Systems Evaluation Group.

The training program is unique to Lance history — providing for assembly, transportation and live fire of 14 missiles within one year. Its success may be measured by the enthusiasm, confidence and pride displayed by the men of the 1-12th FA.



Redleg Rangers

FORT STEWART — The 1st Battalion (Ranger), 75th Infantry, is the first battalion-size Ranger unit formed since World War II's "Merrill's Marauders." The elite force is composed of highly trained and motivated airborne-ranger qualified personnel prepared for immediate deployment wherever a US military presence is required.

By organization and training, the 1-75th INF is capable of:

- Air, land, water, foot mobile and parachute operations to conduct raids, ambushes and attacks against key targets in enemy territory.
- Maneuvering with speed and surprise in all types of terrain and climate conditions, day or night.
- Independent operations when required.
- Conducting limited sustained combat operations by accepting attachments of combat, combat support and combat service support augmentation.
- Establishing a credible American presence in any area of the world to demonstrate the United States' resolve.

Typical missions of the unit include commando-type raids or special operations against deep targets such as nuclear storage sites, missile sites, key enemy military (or political) personnel and resources.

The Ranger battalion is composed of infantry, field artillery, signal, quartermaster and medical corps personnel. Twelve of the 590 men are field artillery, performing various tasks relative to fire support coordination for amphibious, airborne and airmobile operations. A FSCOORD team at company level is comprised of a first lieutenant, recon sergeant and a radio telephone operator (RTO). A team is permanently assigned to each line company, providing the commander with artillery, tac air, naval gunfire and aerial field artillery support expertise and training advice during all operations. At battalion level the FSCOORD team consists of a captain, fire support coordinator, recon sergeant and an RTO. The team performs the acquisition, planning and coordinating

Crew dry and combat ready, self-propelled launcher of 1st Bn (Lance), 12th FA, negotiates a water obstacle during a recent two-day swimming and airlift exercise at Fort Sill.

Right By Piece

Rangers undergoing fire support coordination course at Fort Sill.



of all available fire support. Though an integral part of the battalion organization, FSCOORD teams do not rely on habitual infantry-artillery unit relationships as fire support may originate from US, allied or a combination of friendly forces.

Ranger FSCOORD teams and weapons platoon leaders attended a one-month fire support coordination course at Fort Sill, learning to plan and coordinate available fire support and then experience its employment first hand. Air guide/ground forward air controller instruction was recently integrated into the training cycle. The artillerymen's abilities have been tested and refined during training exercises conducted since the battalion's activation in January 1974.

With support provided by the Redleg Rangers, the 1-75th INF is prepared to lead the way.

New AN/TPS-25 Mobility

FORT HOOD — The 1st Cavalry Division Artillery has revised the vehicular configuration of the AN/TPS-25 ground surveillance radar toward better physical mobility and a faster operational (start and shut-down) cycle.

The shelter for the radar system, normally mounted in a 1½-ton trailer, is mounted to the front of a 2½-ton truck allowing enough space to mount the radar antenna and modulator to the rear of the shelter. The base plate is bolted directly under the receiver/transmitter shock mount so that the antenna may be leveled by the turnbuckles on the antenna shock mount. Four eyebolts, two on the cargo side rails, one on the front of the shelter and one to the rear of the antenna shock mounts, allow the antenna to be mounted on one or more mast sections as if on the ground. Two power generators and a 28-volt DC generator used to power the radios are permanently mounted in the 1½-ton trailer organic to the section. Fuel is supplied to all generators from a 55-gallon drum mounted on the trailer. Circuit breakers, also mounted in the trailer, facilitate the operation of either generator without disconnecting any cables.

Mounted on the 2½-ton truck, the radar can be moved quickly and put into operation in a matter of moments, since moving to an alternate position requires only a temporary shutdown of the radar and the generators. Also, tests or repairs can be made with the radar in its operational mode.

The "Red Team" has been operating the TPS-25 in the new configuration for the better part of a year during many field exercises and reports little difficulty with either the operation or the maintenance of the system.

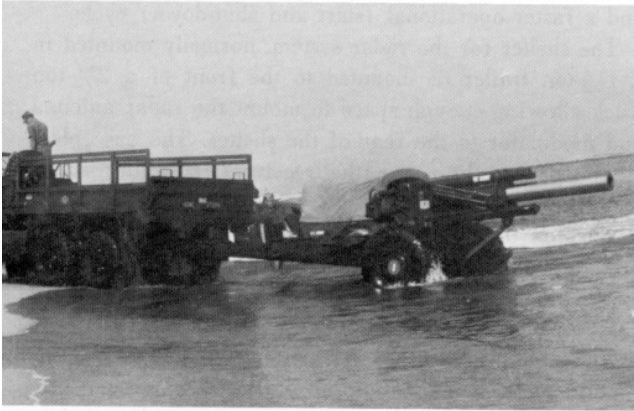


New vehicular configuration—TPS-25 mounted on 2½-ton truck.

Redlegs Sprout Waterwings

NORFOLK — The 1st Battalion, 82d Field Artillery, earned the distinction of becoming the Army's first and only fully-qualified amphibious artillery unit while at the Little Creek Naval Amphibious Base training area recently. Trained by the experts of the Landing Force Training

Right By Piece



A five-ton truck of 1-82d FA heads for the beach.

Command Atlantic, US Navy, all members of the battalion underwent two weeks of intensive instruction in the grueling and precarious arts of an amphibious operation.

The battalion was confronted with a myriad of training requirements from the outset. Several hours of dry and wet net training on the side of an LST and orientation on the different types of naval landing craft familiarized the "land lubbers" with a different medium of transportation. Extensive instruction was also devoted to the successful negotiation of beach obstacles and the waterproofing and water-driving of wheeled vehicles. Battalion officers spent many hours learning the intricacies of embarkation and landing planning, including ship-to-shore logistics, landing force aviation and use, and artillery and naval gunfire planning and staff procedures.

The most chilling experience of the two-week training occurred during "surf indoctrination" and small boat

training in the Atlantic Ocean. Artillerymen proudly displayed their red legs, chests and arms after a few spills into the brisk waters of the Chesapeake Bay.

The training period terminated with a coordinated amphibious assault on the beaches of "Anzio I" and "Anzio II" at Little Creek, VA. The operation was executed with the precision and confidence of an enthusiastic and well-prepared unit.

Pershing Operational Tests

REDSTONE ARSENAL — Seventh Army soldiers from Europe return to Florida to prepare for operational tests with the Army's Pershing battlefield missile. The commander of the Pershing Operation Test Unit, LTC Gerald Curbow, flew to Cape Canaveral with his men and equipment from bases in Germany.

The first unit to arrive was Battery D, 3d Battalion, 84th Field Artillery, commanded by MAJ Joseph Weedel.

On standby, just as they were in Europe, the units do not know when the coded firing order will come. They must be ready to go at any time. Missiles will be launched from the Cape Canaveral Air Force Station and impact in the ocean approximately 400 miles away.

Soldiers of the 3-84th will return to duty stations in Germany after firing, but they will be replaced by other units during the coming weeks for additional missile tests.

The 400-mile-range Pershing has been operational for

Battery C, 1st Battalion, 818th Field Artillery, launches four Pershing missiles.



almost 12 years with battalions in the United States and Europe, including the Federal Republic of Germany Air Force, and is a major part of the NATO nuclear shield. This marks the third consecutive year at the cape for Army operational tests, helping to evaluate the efficiency of both men and equipment.

COL Samuel C. Skemp Jr. is the Pershing project manager at the Army Missile Command, Redstone Arsenal, and James F. Conner is the on-site technical supervisor for firing operations. COL Edward F. Ramsey, Chief, Department of Army Field Office, Air Force Eastern Test Range, coordinates firing activities for the Army.

Soldiers of the 3d Battalion, 9th Field Artillery, stationed at Fort Sill, have moved to the Air Force Eastern Test Range on temporary duty to support the firings.

Pershing II Development

ORLANDO — The US Army Missile Command has awarded Martin Marietta Aerospace \$22-million increased funding for further development of the Pershing II missile system. Work on the contract continues the advanced development program begun early last year on the system's radar correlation terminal guidance system. The multi-year funding calls for continued development and captive flight tests of the guidance equipment and, later, test firings of

prototype missiles with the terminal guidance.

Captive flight testing of the guidance system is already in progress. The first phase — with the equipment aboard an Army Chinook helicopter for low-altitude runs — was successfully completed in June. The system is now installed in a wing pod on a converted FJ4B jet aircraft for high-speed, high-altitude trajectory tests. When this phase is completed at Orlando, the captive test program will be continued at the Army's White Sands Missile Range, NM.

Pershing II is a modular improvement to the currently deployed Pershing 1-A. Its terminally-guided reentry vehicle will replace the present inertial guidance, providing a significant improvement in accuracy. This improvement will give increased military effectiveness against a broad spectrum of targets.

The Pershing II missile will be launched, as is the 1-A, on an inertially guided trajectory to the point where the reentry vehicle separates. It will then proceed on a ballistic path to the terminal phase, where the all-weather radar is activated. The radar system will correlate the returns from the target area with a prestored area reference map. Several such correlations are obtained during the terminal descent to derive position information for updating the inertial position of the reentry vehicle.

The present Pershing 1-A first- and second-stage motors and ground equipment are utilized to full advantage in Pershing II.

GRAFENWOEHR—Utilizing the concealment of the dark Grafenwoehr forest, the 1-22d FA completes a fire mission during a three-day exercise under the ARTEP concept. Charlie Battery commander, CPT Don G. Helmaster, favorably noted the training value of the operation, "Because we are moving and shooting more, the men are getting more out of this test. In the past our guns were tied to the range roads. Now our batteries can move across country using the terrain for concealment. This will enhance survivability during combat."



THE QUESTION OF GOVERNMENT: AN INQUIRY INTO THE BREAKDOWN OF MODERN POLITICAL SYSTEMS, by David Fromkin, Charles Scribner's Sons, New York, 1975, 228 pages, \$8.95.

David Fromkin, an international lawyer who divides his time between the United States and Europe, has within his thesis a despairing mood with only a glimmer of hope. His theme is that government in the post-World War I industrial era can succeed only if "techniques that will effectively counteract the socially disintegrating tendencies of the industrial revolution" are developed. He thus challenges the democratic optimism of Charles E. Merriam's *Systematic Politics* (1945) and favors the Chicago school of political analysis characterized by the systems approach of Gabriel Almond and David Easton. The ultimate goal he envisages seems to be best expressed by Richard Falk's dedication to *A Study of Future Worlds* (1975): "So that my children and your children and all children might live in a future world that is peaceful and fair, that is mindful of nature and that is hopeful about the material and spiritual development of humankind."

In order to achieve his future order, Fromkin proposes a world government (or a stable balance of power) with a common course of action, the organization required to bring events under control, a government that is both responsible and responsive and, above all, a sense of community. Only such a government can deal effectively with the problems of economic control, the energy crisis and the future human environment. In pointing this out Fromkin utilizes political writers over a broad span of time — from Aristotle to Austin Ranney.

Several minor themes of *The Question of Government* prove to be highly interesting and rewarding. His analysis of the concept of "the West," the weakness of revolutionary regimes and the successes and failures of Roman government are provocative. Fromkin reduces the function of government longitudinally and cross-culturally to the irreducible minimum: it enables humans to operate as a group. This role definition differs little from that of Mulford Q. Sibley in *Political Ideas and Ideologies* (1970), but Fromkin puts it in simpler, more basic terms and then suggests 10 generic limitations to the ability of government to resolve the problems of the 1970's and the future.

The "Notes" section of the book, which appears at the end of the text, is, in general, complete and replete with substantive notes. One could hope, however, for some updating to recognize the works of Robert Heilbroner and Paul Erlich, as well as several of the studies emanating from the World Order Models Project. These suggest much the same remedies for the maladies of present-day civilization.

All in all, this reviewer found *The Question of Government* to be very rewarding and stimulating and

recommends it to all who are seriously concerned with the future of the government of humankind.

Don W. Chenoweth, assistant professor of social science, Cameron University, received his Ph.D. from St. Louis University in 1971.

THE REVOLUTIONARY PARTY, by Feliks Gross, Greenwood Press, Westport, Connecticut, 1974, 269 pages, \$13.95.

Mr. Gross begins with an almost formal hypothesis to explain his purpose in writing the book. He proposes that to study political parties of radical and rapid change, or of aggressive militancy, from a sociological viewpoint, one must examine party ideology, structure and patterns of action. He further points out that this study must be conducted within the socioeconomic conditions in which the party operates.

This book is a series of essays related, in a general way, through their significance to the ideology, structure and patterns of action of revolutionary parties. The author begins with a comparative historical perspective covering the period from ancient Greece and Rome to modern day. From this historical beginning he advances into an excellent discussion of the dynamics of political parties using a series of models regarding these parties as factors by which social and political change is accomplished. He ties these models to his basic hypothesis with exceptional clarity — this discussion is the highlight of the book. Turning from the dynamics of these parties, he focuses on certain structures and patterns of action that have been used by revolutionary parties. He considers underground movements, political assassinations and the impact of dress, rituals, symbols and myth-making. He concludes his comments on revolutionary parties with a brief examination of command and control systems. From this point the author digresses to a discussion of the sociology of international relations and the conflicting demands of independence and interdependence in today's world.

The author has done an excellent job of presenting the relationships between ideology, structure and patterns of actions of revolutionary parties in their particular socioeconomic environment. My major criticism of the author's work would be the distracting nature of some of the minutia he uses in making an obvious point. Secondly, I would criticize the "tag-on" nature of his comments on the sociology of international relations and the conflict between independence and interdependence. These observations are excellent but their relationship to the rest of his work is sketchy.

The text is worthwhile for the military reader because of the insight it provides into the function of revolutionary parties, such as those faced in Southeast Asia.

MAJ Peter T. Zielenski is assigned to the Readiness Group at Fort Sheridan, IL.

REDLEG Newsletter

The Graduate Civil Schooling Program is designed to meet specific Army requirements in predetermined disciplines. Prerequisites for selection are an outstanding performance record, a primary specialty qualification and an academic record which will support an officer's designated (or anticipated) specialties. Undergraduate schooling (Degree Completion Program) is currently available to officers who possess records which support promotion and retainability, can complete their degree in 12 months or less and are available for reassignment. Consideration is generally limited to those officers who have completed the Officer Advanced Course. Civil schooling application (see AR 621-1, dated 6 May 1974) are accepted any time and remain active in your Branch File until you are selected, notified of nonselection or otherwise become ineligible. All officers interested in graduate schooling should contact their management division to determine current shortage disciplines (Army requirements) prior to submitting an application: Company Grade, Combat Arms Division - Captain Sharp or Miss Wright, AUTOVON 221-7818/7819; Majors Division - Mrs. Agnes Burns, AUTOVON 221-8119; or, Lieutenant Colonels Division - Mrs. Younger, AUTOVON 221-0752.

ORSA Business
Engineering, ADPS
Engineering,
Aeronautical
Engineering,
Communications
Psychology, Social
Physics, Nuclear
Education, Audio
Visual Aids
Hotel & Restaurant Mgt.
Correctional
Administration
Engineering, Radio
Psychology,
Experimental
Engineering, Petroleum
Topography-Photo
Production, Motion
Picture
Food Technology
Physics-Optics
Statistics
Safety
Engineering, Physics
Physics, Elec. Magnetic

Cultural Foundations
Astrodynamics
Engineering, Nuclear
Effects
Engineering, Chemical
Guided Missiles
Geodetic Science
Criminology,
Corrections
Geography
Psychology, Applied
Transportation &
Traffic Mgt.
Banking & Finance
Textile Engineering
Engineering,
Metallurgical
Math, Crypto
Jet Propulsion
Metallurgy
Applied Mechanics
MBA (ADPS,
Comptrollership,
Logistics
Managements, ORSA)

Company Grade, Combat Arms Division, has 55 openings in the following disciplines for fully-funded advanced civil schooling during FY 76. Selected officers study for a period up to 18 months and are required to serve a three-year utilization tour immediately following graduation. If interested, apply under the provisions of Chapter 4, AR 621-1, dated 6 May 1974.

| | |
|-----------------------------|-------------------|
| Journalism | Logistics |
| Operations Research/Systems | Management |
| Analysis | Electronics |
| (Engineering & Business) | Engineering |
| Comptrollership | Nuclear Physics |
| Automatic Data Processing | Social Psychology |
| (Engineering & Business) | Area Studies |

Combat Arms Division has a total of 125 openings for officers to enter graduate school for the purpose of obtaining a Masters Degree and remaining at the same institution to serve a three-year tour as an ROTC instructor. In cases where a university does not have a master program, the graduate degree will be pursued elsewhere. If interested, apply under the provisions of AR 621-101, dated 1 May 1974. Officers must study in one of the following shortage disciplines.

| | |
|----------------------|----------------------|
| Area Studies | Logistics Management |
| Engineer Electronics | ADPS Business |
| ORSA Engineering | Procurement & |
| Comptrollership | Contract Mgt. |
| | Journalism |

There is a continuous need for instructors at the United States Military Academy (USMA) who are non-USMA graduates. Officers interested in such an assignment who meet the general prerequisites should communicate their interest to their assignment officers. The prerequisites for instructors include: outstanding manner of performance record; sufficient undergraduate grades and GRE scores to assure acceptance in graduate school; primary specialty qualified-one year of command; three years of experience at battalion/battery level; and satisfactory completion of the Officer Advanced Course.

As was reported in the last newsletter, specialty designations for captains commissioned prior to 3 June 1968 were mailed to the individual officers on 15 July. Any captain who has not received his specialty designator letter should contact Major Koenigsbauer, Specialty Coordinator, Combat Arms Division, AUTOVON 221-7820/7819. The largest designations for Field Artillery captains were Operations and Force Development (26.5 percent), Personnel Management (18.6 percent), Research and Development (12.9 percent) and Tactical Strategic Intelligence (7.9 percent). Any questions concerning specialty designator should be directed to Major Koenigsbauer.