

FIELD ARTILLERY JOURNAL



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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.

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The cover this month is an original montage designed by our staff artist, Mr. Carl "Sam" Ewing, depicting various aspects of the Field Artillery System for today and tomorrow.

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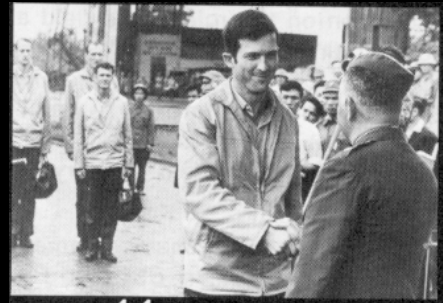
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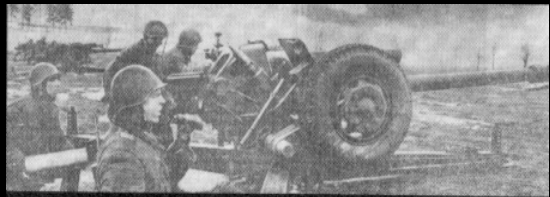
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a word from the editor

We believe that this, our eighth edition of the **Journal**, is one of the most interesting to date. In fact, it is rather difficult to decide where to begin telling you about it.

To say that the Mideast War brought about changes in our thinking concerning artillery tactics, techniques and materiel development is almost an understatement. The commandant has addressed these changes in this issue. MG David E. Ott has contributed two pieces: a discussion on the role of the field artillery in suppression and, in the new standard feature "Forward Observations," an overview of the future of the field artillery on the modern battlefield. Along this line, Mr. Al Boules, our staff writer, has provided a piece on the 1974 Field Artillery System Review held here 23-24 October.

In response to the many comments from our readership survey we have obtained several articles on foreign tactics and equipment. LTC Jon Porter and LTC Gerhard Dobbert have translated the first of a three-part series on the Mideast War which is one of the best we've read. Written by COL Horst Toepfer of the German General Staff, the article was first published in a military periodical of the Federal Republic of Germany. CPT Eugene Betit, a student in the Russian FAO program, has translated a very recent article by the Soviet Chief of Field Artillery and Rockets and it is a "must" for all Redlegs. French Liaison Officer to the School, Lieutenant Colonel DeDinechin, has contributed an article on the development and testing of the new French 155-mm self-propelled howitzer, the GCT.

MAJ Ronan Ellis, a recent C&GSC graduate and now a member of the School's Target Acquisition Department, wrote the article on the employment policies of tactical nuclear weapons, "Beyond Deterrence." The paper was written for the Tactical Nuclear Elective at C&GSC.

COL John Pappageorge of the Strategic Studies Institute, Carlisle Barracks, becomes the first infantryman to grace the pages of the **Journal** with his article,

"A Relationship Like No Other." We hope to obtain articles from members of other combat arms branches in future issues.

Redlegs from the field have given us two good articles. MAJ John Sarantakes, the former commander of the composite field artillery unit that supports the Infantry School, has written an article about that unit. COL Burt A. Vander Clute, Commander of the 42d Division Artillery, has provided some interesting training tips for a div arty FSE.

CPT Bill Reeder, a former Vietnam POW, has written an article on his capture and captivity that, once begun, will be very difficult to put down—an excellent first-person narrative.

This being the season for Saint Barbara observances throughout the world, it is only appropriate that we include an article on the patron saint of artillery. MAJ J. Hunter Beaty has written the most complete biography we have had the opportunity to read and we have passed it along with the thought that units may want to include a portion of it in their annual celebrations.

A special thanks is due to the contributing authors of our feature material. Majors Jackie Sims and Bob Edwards (a former contributor) of the Gunnery Department wrote the information on the revised training of FOs and 13Es, respectively. Ralph Rosenberg (also a former contributor) of the Tactics and Combined Arms Department wrote the piece on the new threat classes for the Advanced and Basic Courses. MAJ Bob Trask gave us the update on the RPV and SP4 Tom Waller of the 212th FA Group did the article as well as the pictures on the C-5A training.

Redlegs should also be advised that there has been a change to our subscription policy. As a result of a recent DA directive, operation of the School's Book Department was terminated as of 1 December 1974. Subscriptions to the **Journal** will continue under the control of the Field Artillery Museum Association at the same price of six dollars a year. Subscribers were notified by letter in October and we would remind our readers that gift subscriptions of the **Journal** would make excellent presents. The address is, Field Artillery Museum Association, Fort Sill, OK 73503.

While we are on the subject, on behalf of the **Journal** staff, we would like to wish all our readers the happiest of holidays and the very best for the coming year. As you can see from this issue, 1975 promises to be an exciting year.

Enjoy your **Journal!**

editor

INCOMING

letters to the editor

A Sad Note

I was saddened to read in yesterday's St. Louis *Post Dispatch* [15 Sep 1974] that MG Robert M. Danford, USA Retired, had passed away in Stamford, CT, at the age of 95.

General Danford was the Army's last Chief of Field Artillery and had retired early in 1942 when the Army was reorganized and the [positions] of Chiefs of Branches and Services were eliminated.

While General Danford's accomplishments were many, your readers may not know that present day Army aviation owes its start to General Danford. As Chief of Field Artillery it was General Danford who directed the Commandant of the Field Artillery School to organize and train pilots, mechanics and air observers for the purpose of using Piper Cub airplanes as spotters for the field artillery. After two months of training, two detachments were fielded by the Field Artillery School, one with the 2d Div Arty and the other with the 13th FA Brigade for test.

A short period of test proved the concept and on June 6, 1942, the War Department approved the inclusion of Air OP sections as a permanent part of each FA gun and howitzer battalion.

Truly, General Danford was a godfather of Army aviation and I believe all field artillerymen and others in the Army owe him a special salute!

Here's hoping you can keep the presses rolling along on the new **FA Journal**.

Delbert L. Bristol
COL (Ret), FA
Florissant, MO

Improved FDC

The July-August 1974 **Journal** contained an article, "Improved FDC." Having returned from a three-year tour with the 1st Armored Division Artillery (Germany), I find some improvements recommended in the above article "nice" but not practical for the fast moving, mobile environment found in an armored division.

Participating in Reforger III & IV, Wintex 71 and 73, and numerous FTXs, it was found that a DS battery FDC (M577A1) could not afford the luxury of setting up elaborate operations in the extension tent.

What we needed to support armor operations was a self-contained FDC. The

Canadian artillery at Lahr, Germany, had modified all of their M577A1s so that the firing chart, situation map and all plotting equipment and forms fit within the vehicle and at the same time allow personnel to perform their duties. The adoption of the German artillery's telescoping antenna, which is found on all of their FDC vehicles, could be fitted to our vehicle (M577A1). Affixing a permanent 3KW, 400-cycle generator, two each, to the top of the M577A1 would reduce wear and tear received by this equipment. Last, but not least, the FADAC must be internally mounted with the connector cables affixed to the hull of the vehicle.

The FDC in an armored division must be mobile to survive. Connecting equipment to extension poles, requiring movement of FADAC generators and externally operating FADACs are luxuries that cannot be afforded.

George W. Glann Jr
CPT, FA
HQ, Readiness Group
Fort Knox, KY

Thank you for the information. We have written to the Canadian Regiment in Germany requesting information and pictures of their FDC setup.—Ed.

Ironhorse Ranch

Dear General Ott:

Members of the 4th Infantry Division (Mechanized) have been reading your new **Field Artillery Journal** with



BG William Mundie (center) being briefed on the new twist to the ATT. See article on page 59.

great interest. Very sincerely, we think you have a first-rate professional magazine.

I am proud of our Redlegs and the training they are conducting. One example is summarized in the attached proposed article which describes the unannounced battery ORTT recently administered by our GS battalion, 1st Battalion, 27th Field Artillery. Perhaps, other field artillerymen would be interested in this twist to the standard ATT.

Hope you will find time to visit us soon at the Ironhorse Ranch.

William L. Mundie
Brigadier General, USA
4th Infantry Div (Mech)
Fort Carson, CO

The article on the Kingsmen appears on page 59. Brigadier General Mundie has since been assigned to Headquarters, MILPERCEN.—Ed.

The Offensive

I was certainly pleased by your kind letter, and much impressed by the new **Journal**—I think it is far better than the old "Grey Lady" of pre-WW II days, and equal to the **Journal** which those two able and highly-dedicated editors, Colonels Nye and Coleman, produced in the war years.

My comment on "Nastupleniye" [The Offensive] (July-August 1974 **Journal**) is laudatory also. Possibly some of the transitions could have been smoothed over by editorial insertions, and interest is not uniform, but the article as a whole is clearly authentic and professionally stimulating. While I was Chief, Allied Contact Section, Hq USAREUR (1960-63), I had many discussions with Colonel Chernikov, Chief of the Soviet Military Liaison Mission to our forces in Europe at the time, regarding the Soviet artillery division. He had been chief of staff in one during the closing phases of World War II. He impressed me with some of the advantages. One was ease of massing conventional fires. Another was giving the corps and army artillery units—often waifs with us—a two-star papa to look after them and a true home and their own patch. You might ask someone in your Intelligence Department to discuss Soviet higher artillery organization in a future issue.

Your Yale story tickled me, too. I know the author, Colonel Downey; I met General Danford, the last Chief of Field Artillery; and I was commissioned from Yale in 1936.

Thanks again for writing and sending me the magazine. The best of luck to you and it.

Edward A. Raymond
COL (Ret), AUS
Litchfield, CN

*The Colonels Nye and Coleman referred to by Colonel Raymond were William S. Nye and John E. Coleman, both former editors of the **Field Artillery Journal**. Colonel Coleman recently visited Fort Sill to attend the dedication of the new post library, named in honor of Colonel Nye, noted historian and author of the best known history of Fort Sill, **Carbine and Lance**.—Ed.*

MRL

The July-August 1974 **Journal** contained an article by LTC Allan R. Stern, "Do We Need a Multiple Rocket Launcher?"

Without further comments at this time, I would like to make the following observations on the article regarding the German Multiple Rocket Launcher systems.

The 110-mm MRL system was fielded in 1970 and is part of our division artillery. The rocket has no aerodynamic stabilization but is stabilized by a folded fin system.

The 280-mm multiple rocket launcher mentioned in your article is a combined British - Italian - German development known under the name Rocket System 80 (RS-80). It is in an early stage of development and has not yet reached the "field testing" phase.

LTC G. U. Dobbert
German Army Liaison Officer
USAFAS

Target Acquisition

As an alumnus who first learned his sound-ranging and flash-ranging in the old 1st Observation Battalion (TAB) at Fort Bragg in the historical past, I was most pleased to hear by way of Colonel Kleypas' letter ("Incoming," July-August 1974 **Journal**) that the 1st TAB is "alive and well" and doing business at the same old stand.

In my previous letter to the **Field Artillery Journal** ("Incoming," March-April 1974), I by no means intended to imply that his outfit was failing to keep up a high standard of training. On the contrary, it seems to me that an excessive responsibility is being forced onto the 1st TAB. As the only unit of its kind in the Army it is the only place where practical field training of this kind under simulated combat conditions is being carried on.

In World War II its predecessor had to sire some 25 similar units. The early ones were quite well off as to cadres; but as the war progressed the cadres were diluted much too thin. We should learn from such past experience. Based

on the number of active firing FA battalions, a reasonable proportion now would call for about 10 TABs instead of Colonel Kleypas' one. Put another way, on mobilization the lone TAB would have to expand 10 times as fast as other battalions—this in spite of the greater number of specialists and higher level of training required.

Possibly because neither the technical difficulties nor the scientific advances of recent years are adequately appreciated, there seems to be some sort of hidden assumption that TABs can simply be activated from paper units. This is even more absurd than a corresponding idea would be applied to firing battalions. We cannot wait until the need exists to improve and expand our current limited counterbattery capability.

The AALS sound-ranging system, recently tested at Fort Sill, still needs to be proven technically and tactically. (I have distinct personal reservations about it on both counts.) In the meantime, the present systems of sound-ranging and flash-ranging, based on European conditions, have become increasingly rigid and inflexible. We need to train in fundamentals so methods and equipment can be better adapted to "unusual" conditions. We must make adequate provisions in time for flexible, adaptable counterbattery systems. This requires officers with appropriate scientific training and practical field experience to improve the techniques and prepare mil specs for improved equipment. We need to upgrade and expand all courses for specialists, so that they not only can perform under favorable routine conditions but have the background to adapt their systems to the "unusual" that seems to be "normal" in combat. We need to train our staff officers to make proper use of counterbattery agencies based on technical advice of trained TAB officers.

In the past there has seldom been any problem in selling the need for adequate counterbattery capability to the troops who have been unfortunate enough to "outfield enemy cannon balls." (Note Major Parnell's letter, "Incoming," July-August 1974 **Journal**.) Also some of the people at the top levels seem to be aware of the importance of the problem. But somewhere along the line there is a lot of foot dragging.

In the past we have generally enjoyed a large preponderance over the enemy in artillery. There is no assurance that this will continue to be the case, even in relatively small scale operations. (Again see Major Parnell's letter.) A relatively small investment in counterbattery location capability can make up for several times as many firing units, to say nothing of the quantities of ammunition that would be saved, instead of being uselessly strewn over empty real estate.

While we all agree that "Artillery is King of Battle," it may become a question of whose artillery?

Arthur R. Hercz
COL (Ret), FA
Ann Arbor, MI

More Copies

The word is spreading. Yesterday I was asked by the J5 (Plans) of the Philippine Armed Forces if it is true that the **Field Artillery Journal** is being published again. I was delighted to assure him that the **Journal** indeed has been revived, and today I gave him copies of the two latest issues that have reached us here in Manila. The J5, BG Mateo C. Evangelista, no doubt will be remembered by fellow field artillerymen who were with him at Fort Sill in the Advanced Course in 1961.

We currently receive two copies of the **Journal** at JUSMAG. I would like to get two additional copies of each issue, one for the Philippine Army's Artillery School and one for their Staff College.

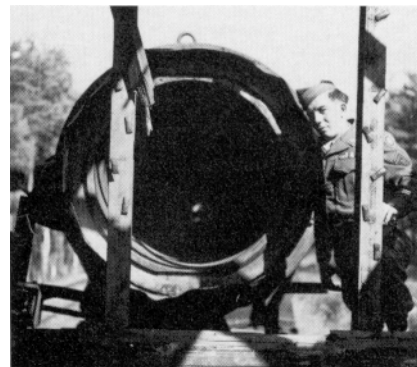
Please let me know how we can change our subscription to arrange this.

Jack R. Sadler
Brigadier General, USA
Chief, JUSMAG-Philippines

Arrangements have been made for the requested copies.—Ed.

Greatest Gun

During a recent conversation with my father, I learned that he had taken photographs of the 800-mm gun described in the May-June 1974 issue of the **Field Artillery Journal**. The article was, I believe, entitled "The Greatest Gun."



In response to the editor's note at the end of the article, I am forwarding the photos to you along with a short letter of explanation. I would greatly appreciate a copy of the May-June 74 issue, as mine was lost during PCS.

Charles M. Bosley
2LT, FA
Fort Ord, CA

Thanks for the photos, and please convey our appreciation to your father. We have sent you two copies of the issue you requested so you may forward one

(continued on page 63)

forward observations



MG David E. Ott

The future of the Field Artillery can be characterized by one word. That word is CHANGE. Redlegs everywhere must prepare to adapt proven practice to the accelerating rate of change our arm is now experiencing. "Forward Observations," a new feature of the **Field Artillery Journal**, is my vehicle for assisting you, the field artillery professional, in this adaptation.

Through this feature, I will bring you news of technical, doctrinal and procedural changes. Further, I hope to give you an idea of how the need for changes was determined, how we mean to implement them and which require your priority. The entire way in which the combined arms team approaches modern combat is changing, in part due to careful analysis of lessons learned from the 1973 Yom Kippur War in the Mideast. To implement needed changes, we in the field artillery need better communications between each other and our sister branches. You can, of course, assist this communication process to improve through your feedback to the Field Artillery School. I encourage you to do so.

The year now ending saw the emergence of a variety of changes critical to the future of the Field Artillery. One of the most important was a reorientation in our primary goal. That goal, timely, first round fire for effect accuracy, is now within our grasp. Through new developments in rocket assisted and guided ammunition, improved cannon materiel, increased range of new target acquisition systems to include a remotely piloted vehicle, revised procedures in gunnery such as the ABCA registration, TACFIRE, a host of tactical doctrine changes and new training methods to keep our Redlegs up-to-date and competent, we can achieve this goal on any battlefield in the foreseeable

future. By focusing on the effect on the target we now have the means to overcome many past obstacles in providing fire support to the maneuver arms. I am pledged to the continuous review of all the elements of our Field Artillery System to achieve this goal. I urge you to do the same. There is no finer compliment that can be paid to a Redleg by a maneuver unit commander than "he hit the enemy hard and fast, saving my men and helping me to accomplish my mission."

I mentioned our Field Artillery System earlier, and here is a second major change in how we are dealing with the future. Recognition of our arm as a single, goal-oriented system with many complex but interdependent elements is a key to the achievement of our goal. When one element of our system fails to adequately support the system as a whole, we all can fail. Thus, increased ammunition and materiel capability require greater ranges, better trained personnel and increased sophistication in our means of massing fires. Assuming a potential enemy has similar goals, we must also seek system survivability and means to suppress his fire support effort. Finally, our close relationship to the maneuver arms must be further strengthened to increase our reliability and their ground gaining capability. I invite your attention to the article in this issue on the 1974 Field Artillery System Review to gain a further understanding of the system concept.

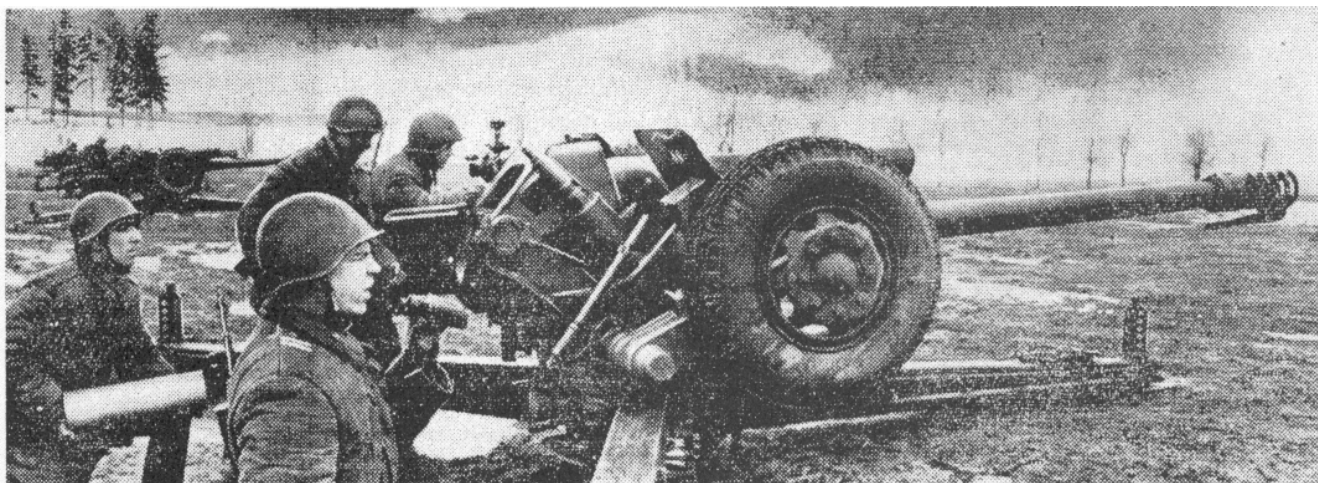
1975 holds tremendous promise for the improvement of our system. I will list but a few of these to prepare you for more detailed information in future "Forward Observations" and in other media.

—The Scenario Oriented Recurring Evaluation System (SCORES) is now able to provide combat developers with a standard set of realistic, combat scenarios which will become the focal point of all combat developments and the basic integration device for the combined arms team. These scenarios are used to evaluate and test current and proposed organizations, doctrine procedures and materiel. Selected situations and "real-world" conditions are used in which specified US forces (TOE) are employed in specific geographic areas of vital interest. All combat arms service schools are coordinated in this effort.

—Techniques of Field Artillery System employment are being revised to provide improved reaction time through quick fire planning, improved close support through dedicated batteries in special circumstances, improved survivability through suppressive fires and offset registrations. These will all be topics of future **Field Artillery Journal** articles and training circulars to get the changes to the field as quickly as possible.

—Training Extension Courses (TEC) lessons are being fielded to provide multi-media instruction in a variety of
(continued on page 14)

Basic Directions in the Training of Artillery and Missilemen



A 122-mm howitzer (D-30) crew from the Baltic Military District during recent range firing exercises.

by
Marshall of Artillery
G. Peredel'skii

translated
by
CPT Eugene D. Betit

*The following article is reprinted from the February 1974 issue of the Soviet military periodical, **Voennyi Vestnik** (The Military Herald). The publication, aimed at career military personnel, is similar to our **Military Review**. The author, Marshall of Artillery Peredel'skii, is the commander of the Soviet Ground Forces' Rocket and Artillery Troops.*

*The article was translated and submitted to the **Journal** by CPT Eugene D. Betit, MI, now in the final phase of the USA Russian FAO training program. The captain is currently pursuing an MA degree in Russian Studies at Georgetown University; recently completed studies at the US Army Institute of Advanced Russian and East European studies; and is a graduate of the Defense Language Institute Russian course. He has served in intelligence assignments at Headquarters, USAREUR, and with the 2d Field Force in Vietnam. "River Crossing-Key to the Soviet Offensive," by Captain Betit, was published October 1971 in **Military Review**.—Ed.*

THE BASIC, guiding principle for training missilemen and artillery troops, as well as personnel of all branches, remains: "Train as things are done in actual combat." Strict adherence to this rule guarantees proper field training for every soldier and officer and constant combat readiness of units.

All the important training elements are concentrated in *field training*. The basis for field training's special usefulness is the *maximum approach to actual combat conditions*. With this goal, all training, combat launches of missiles and artillery firing must be conducted under complex and dynamic situations, without watering down or shortcuts. Special attention should also be given to practical work with equipment and weapons under different climatic conditions, seasons and times of the day.

The success of missile and artillery units commanded by I. Morozov, I. Popov, Iu. Chernikov, M. Rostorguev, A. Doroganich and others is regular. It is primarily explained

by the fact that these commanders attach great importance to tactical training, *field* training. It's not by accident that soldiers, NCOs, warrant officers (*prapor-shchiki*) and officers display a high degree of specialized training, and the ability to complete marches over great distances, deploy from the march in unfamiliar territory, deliver effective missile strikes and precise artillery fire.

In past years, much has been done to increase the field training of officers. The majority effectively organize for combat deployment of their units, efficiently command even under complicated conditions.

However, some officers still do not have a firm knowledge of regulations, do not issue combat orders clearly, do not organize timely reconnaissance, inadequately consider the influencing terrain. Sometimes rocket strikes or artillery fire are planned without the necessary analysis of enemy data. Besides this, the rapid maneuver of modern combat, the rapidity of its development and its intensity place severe demands on missile and artillery troops—to decisively reduce deployment times for batteries and battalions, as well as for topo-geodetic survey of positions, command-observation posts and for the preparation of rocket and artillery strikes.

All this cannot be attained without prior reconnaissance, which should be continuously conducted under all conditions.

The enlarging of the radius in which sub-units and regiments can engage the enemy complicates the conduct of reconnaissance by observation. Thus, aside from acquiring data by their own means, commanders must effectively use information obtained from higher commanders, artillery, technical radio reconnaissance [SIGINT], sound, optical, etc.—as well as aerial reconnaissance and from other branches and neighboring units.

The modern battlefield will be significantly different from that of World War II (the Great Fatherland War). The nature of targets has changed, tactical nuclear strikes are now possible, and antitank guided missiles, self-propelled artillery, radar, etc., now exist.

When training artillery reconnaissance personnel we must insure that they know well the recognition features of the enemy's modern combat equipment and weapons. During training exercises we ought to simulate targets and situations which force the troops to conduct active reconnaissance and ranging of detected targets and also determine their character (antitank guided missile-ATGM, launch platforms, artillery batteries, operational radar stations, tank columns). This would enable us to avoid certain arbitrariness and "simulation" in the training of reconnaissance personnel.

Unfortunately, one must observe that reconnaissance is often conducted "formally." Not all officers strive to obtain independent recon data, some are satisfied with information received from their superiors. Often they completely forget that uninterrupted reconnaissance, constant refinement and analysis of data, is their direct responsibility.

No less responsible and complicated are the actions required of artillerymen during reconnaissance of march routes, during the selection, survey and preparation of fire positions. This is conditioned by the increased maneuverability of troops and the dynamics of combat actions, in the course of which batteries and battalions

These pictures of a multiple rocket launcher battery from Leningrad Military District were taken during a recent training exercise. The left picture shows the battery in firing position, while the one on the right depicts Battery Captain A. B. Velonishkis and his reconnaissance squad leader Senior Sergeant K. Khalilov at the OP.



frequently must effect rapid maneuver to accomplish required redeployment during a breakthrough of defenses or the repulse of an enemy counterattack, engage his tanks, destroy air landings, as well as relief or reinforcement of units subjected to nuclear strikes. In any situation, during deployment, artillery units must maintain a high state of combat readiness and arrive at the appointed area on time, with the troops, equipment, guns and necessary reserves to fulfill their combat mission.

Our units have acquired no little experience in completing marches in various tactical situations, in different terrain conditions and various seasons, sometimes over great distances. On training exercises many of them have displayed great ability and maneuverability during marches.

All of this has permitted their timely combat deployment from the march, their accomplishing complex missions and the uninterrupted support of motorized rifle and armored units. It is important that this accumulation of positive experience in march preparation now be introduced into practical unit training.

In combat, the actions of each arm cannot be independent from the others. Their success to a great extent

Part of a Soviet RPU-14 airborne artillery unit during firing exercises this summer.



depends on precise organization and uninterrupted mutual action. When nuclear weapons are not employed, artillery will follow them [in the attack] by fire through successive enemy strong points up to the so-called "operational maneuvering space."

For successful accomplishment of these missions it is important to understand the character of actions by motorized rifle and tank units and, in concert with them, to determine the sequence of the use of missile and artillery units and fire support means, effect the assignment of targets and objectives between them and establish the order and timing of their destruction.

Of the many varied means to carry out artillery fire missions it is proper to select those which would permit the intelligent combination of fire and movement on the one hand, while on the other insure the effective destruction of the enemy defensive system, thus reducing casualties among the attacking troops, increasing the rate and the depth of their advance, provide the selection of the most advantageous type of maneuver, etc. All these questions ought to be decided in concert.

In the course of battle, the commanders and staffs of the combined arms and artillery should have reliable communications and systematically exchange information. In addition, they must detect any change in the combat situation and change missions in a timely manner and thus refine previously established plans for mutual action. If it is violently altered, measures must be taken at once to restore the situation or assign new interrelated missions. Here we must insure that every artillery commander knows who he is supporting and that combined arms commanders are able to exploit the effect of artillery fires.

Modern armies are equipped with highly varied and effective antitank means. Thus, the suppression of antitank defenses in any situation is one of artillery's most important missions.

This entails a whole series of measures for the reconnaissance of antitank defenses, their destruction as coordinated by artillery, aviation, tanks and motorized riflemen. To learn how this ought to be accomplished is a primary mission of artillery commanders and their staffs.

In combat, motorized rifle and armored units will often act independently, separated from their regiments. For this reason the role of artillery attached to units increases, and an even greater premium is placed on resourcefulness and decisiveness of artillery commanders, as well as initiative and skillful actions of small units. Thus, in training exercises we should allow greater initiative to platoon and battery commanders, teach them to act bravely and decisively, eliminate unnecessary supervision. Only a resolute, determined officer will remain unshaken in adverse situations and confidently command his unit.

The equipment of armies with modern equipment and the extensive use of mechanical transport increases potential nuclear or conventional artillery maneuverability. The faster missile and artillery strikes can be prepared, the greater their effectiveness.

In practical training, tactics and the conduct of fire missions are being joined all the more closely. Artillerymen are taught to decide tactical and fire missions together, prepare and deliver accurate fires in accordance with the unfolding situation, as well as according to the requirements of combined commanders.

The times we have achieved for the concentration and massing of fires are not limits. There are ample opportunities to further reduce time necessary for reconnaissance and survey of targets, determining of the situation, topo-geodetic survey and preparation of fire plans. Extensive automation will provide considerable reserves in the conduct of nuclear strikes and artillery fires.

Rapid and accurate target detection plays an important role in the timely opening of fire upon targets. The following fire direction methods may be used by artillery units: instrumental guidance to the target, computation with the use of polar or rectangular coordinates or using a coded map. In this regard, marking and smoke rounds should be more widely used, especially at night on terrain with few prominent features.

In the conduct of fire direction, it is important to achieve great accuracy with the first round. It is well-known that when firing upon targets which cannot be observed and under conditions when correction possibilities are limited, errors in firing data cannot be compensated for by expenditure of rounds. Thus, in searching for methods to reduce the time needed to lay preparations, we must strive to increase accuracy, perfect all-around preparation and methods for calculating ballistic deviation and meteorological firing conditions from tables.

It is impossible to be strong in all directions. Thus, troops must know how to tenaciously defend against superior enemy forces when this is needed. Now, when more and more tanks and APCs are on the battlefield, defense is primarily built on antitank means. Some officers think that the engaging of tanks and enemy armored vehicles is the basic mission of specialized artillery antitank units. This is not the case! Combat with armored vehicles is the mission of *all* arms, including all types of artillery.

Antitank means included in the defensive system (antitank guided missiles, artillery, tanks, mortars) should be disposed taking into account engineer and natural obstacles so that close, mutual fire coordination is insured.

At the same time, an artillery system of fire from concealed positions must be created. So that the defense is stable, artillery regiments and sub-units must be disposed and echeloned in depth, positions must be well engineered

and carefully camouflaged. When determining fire missions it is well to provide for the relief of artillery by other units in case some capabilities are knocked out.

In order to confuse the enemy as to the true number and disposition of artillery, we should provide for the periodic relocation of fire positions and CP-OPs, construct dummy positions and make extensive use of roving weapons (platoons and batteries).

Under modern conditions, demands on commanders' artillery mastery have been increased. The transitoriness of engagements and targets' maneuverability require rapid reaction to the changing situation. The greater the personal artillery education of commanders, the faster the fire mission can be accomplished, and with less expenditure of ammunition.

It is well known that definite types of fire, insuring the most reliable insurance of targets' destruction in the shortest time with minimal ammunition expenditures correspond to every type of fire mission. This is so whether it be the suppression of troops in concealed positions or an artillery battery, the destruction of defensive works or assaulting enemy tanks.

Thus, a firm knowledge of the Rules of Firing in their theoretical premises is the only guarantee for successful accomplishment of fire missions. Study of the rules should be "creative" and include keeping abreast of changes and supplements introduced by modern scientific and technical developments; in no case may this boil down to the rote memorization of a few separate articles.

". . . the suppression of antitank defenses in any situation is one of artillery's most important missions."

As is known, an artilleryman's mastery of the basics comes only through systematic training in the preparation of firing data, observation of fire, calculation of correction data—that is, *all* elements included in the completion of a fire mission. Even a well-trained marksman whose training is interrupted for some time "loses form" and has to devote considerable effort to reattain his former confidence. Thus, battalion and battery commanders must devote the most serious effort to artillery firing exercises and not permit them to be frustrated or postponed. Experience shows that officers attain the highest results in missile and artillery firing in units where troop training exercises are correctly planned and regularly carried out, where they are organically connected with an independent study of ballistic theory.

We cannot tolerate officers who do not understand the essence of one or another provisions of the Rules of Firing

in sufficient depth or are weak in their theoretical knowledge. This gives rise to "canned" situations, formalism, [loss of] the commanders' initiative. If fire missions are not carried out as provided for in the rules or texts, they will run into a dead end.

Combat fire missions ought to be conducted under conditions of mobile combat; that is, they should be planned from the start of units' combat employment. This will permit us to devote more attention to the training of batteries to conduct fire in reduced times.

When evaluating the coordination and training of batteries and battalions during exercises, we should start by determining how well they provide uninterrupted support to combined arms units.

It is possible to objectively rate commanders' knowledge and the level of their combat maturity, ability to direct fire only when arbitrariness, simulation and simplifications have been removed from training situations. The commander must take all measures to insure that artillerymen don't know beforehand what type fire mission they will undergo. Methods of preparing firing data, range, projectile type, setting of fuze and charge—all must be selected by the artillerymen in accordance with the tactical situation and nature of the target. To insure that officers really feel themselves to be serving as commanders fulfilling a combat mission, we must create an appropriate atmosphere at the CP-OP, not be overly protective and, to the extent possible, permit freedom of action.

Great responsibility falls to the senior officer of firing exercises to insure that the accomplishing of record fire missions permits the greatest possible evaluation of the gunner's training and at the same time serves as a new step increasing his artillery-gunnery mastery. The supervisor must be demanding, strict and objective in his evaluation. The data which he provides should, in combination with the situation created on the range and the nature of targets and resources available, serve as a basis for the gunner's decisions when engaging targets.

". . . we should allow greater initiative to platoon and battery commanders, teach them to act bravely and decisively, eliminate unnecessary supervision."

Unfortunately, during live firing, which is generally conducted according to basic data furnished by the supervisor, the situation is overly simplified and doesn't effect any improvement of officer or NCO training. We must reject such practice. The basic data provided by the superior must give the gunner a chance to display in full measure his ability to correct fire for effect. Furthermore,

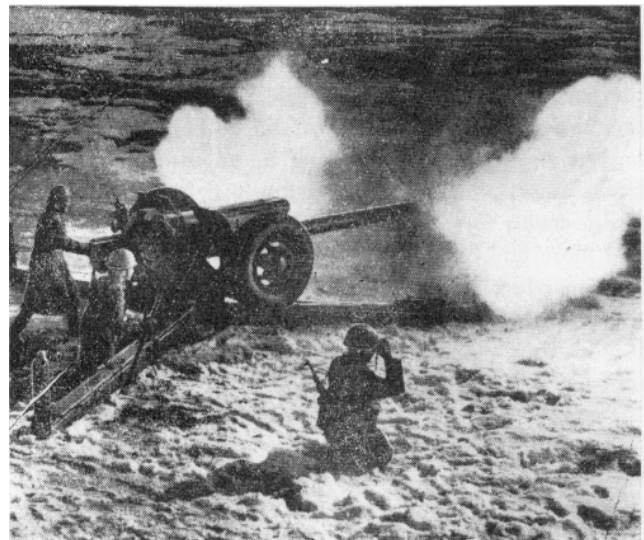
we should make greater use of initiative means to replace this data furnished by the commander.

The critique of the fire mission has great significance. The gunner receives little benefit when his superior tells him how many errors and unnecessary rounds were fired. The critique is of use only when it comprises an analysis of fire missions, showing positive aspects of the gunner's actions and revealing the reasons for the errors he committed. After the critique it ought to be clear what areas need special attention in future exercises.

The carrying out of a fire mission by any artillery unit is grounded in the collective actions of a great number of soldiers—recon personnel, RTOs, data computers, gun crews, drivers of prime movers and other specialists. The improvement of every specialist's combat training and the coordination of their actions in accomplishing the unit's mission is the object of the commander's untiring concern.

Unfortunately, here and there officers underestimate the importance of training to conduct fire *rapidly*, or if they do conduct such exercises, they greatly simplify them and, most importantly, omit the corresponding physical stress.

The experience of tactical live firing exercises demonstrates that during a relatively short artillery preparation a battery must conduct fire with the greatest possible speed in order to achieve a high density of destructive fire. Of course, this demands greater physical exertion from the troops. For example, when firing from the



The Soviet caption on this prize-winning photo was "direct fire," an important part of Soviet antitank doctrine. Artillery units are attached to frontline troops to provide the heavy firepower to destroy enemy tanks, bunkers, strong points, etc., as they are encountered.

122-mm howitzer according to the full technical rate of fire for 15 minutes (charges four-six), about one and a half tons pass through a loader's hands and, in a half hour, up to two and a half tons. We must straightaway admit that not everyone is capable of such physical exertion. Thus, there must be two to three people in each gun crew who are also trained as loaders so that this position can be alternated during artillery preparation.

We cannot disregard materiel support. Gun crews must be fully supplied with training rounds during exercises, and their weight should be the same as actual rounds. Training exercises will hardly produce the desired result if every crew does not have a mount for loading training rounds.

The accuracy of missile launchers and artillery fire depends to a great extent upon their proper technical preparation: rocket launchers, artillery pieces, rockets, munitions, instruments, communications means, etc.

When preparing for combat launch of missiles, or multiple rocket or artillery fire, it is necessary not only to verify that they are in good technical repair, but no less attention must be devoted to the aiming devices. As with any technical work, these checks must be conducted in strict accordance with established norms.

At first glance, all this seems to be self-evident. But the cause of poor sheafs of fire, range calculation errors, fire stoppages, misfires, etc., often find their roots in this very area.

The checking of such instruments demands serious attention: gyrocompasses, theodolites, rangefinders, aiming circles. Optical instruments, as with launch platforms and gun tubes, cannot have the slightest inaccuracy. Carelessness and sloppiness can entail huge errors in missile launches or artillery live fire.

Political workers and Party and Komsomol [Soviet Communist League of Youth] organizations play a large role in the training of determined missile and artillerymen who know their work, can display initiative and are capable of operating in difficult and adverse conditions. They are obligated to serve in the vanguard as Communists and Komsomols, inspire other personnel to overcome difficulties and more widely popularize the achievements of the best soliders.

Translator's Comment

As is made clear by Marshall Peredel'skii, great emphasis is made in the Soviet Army on realistic training, duplicating battlefield conditions to the maximum extent possible. However, this is not always implemented by subordinate commanders, as this article discloses. An article in a previous *Voennyi Vestnik*, for instance, spoke of difficulties experienced by artillery troops of the Group of Soviet Forces in East Germany attempting to train under realistic conditions in some of the small local

training areas. Not only was live firing precluded by their size, but the troops were so familiar with every inch of terrain that reconnaissance and preparation of fire data were done only perfunctorily.

As is well known, the Soviet Army places great stress on heavy artillery preparations and, during the latter stages of the Second World War, it was not uncommon for tubes to be lined up "hub-to-hub" to deliver a withering fire upon the German defenders. Modern Soviet fire control procedures have progressed to the point where it is no longer necessary to line pieces up to achieve this massing of fires, however. Also worthy of note is the extensive use by Soviet artillerymen of a variety of "Katusha," multiple-round rocket launchers, a very effective vehicle for delivering saturation fires.

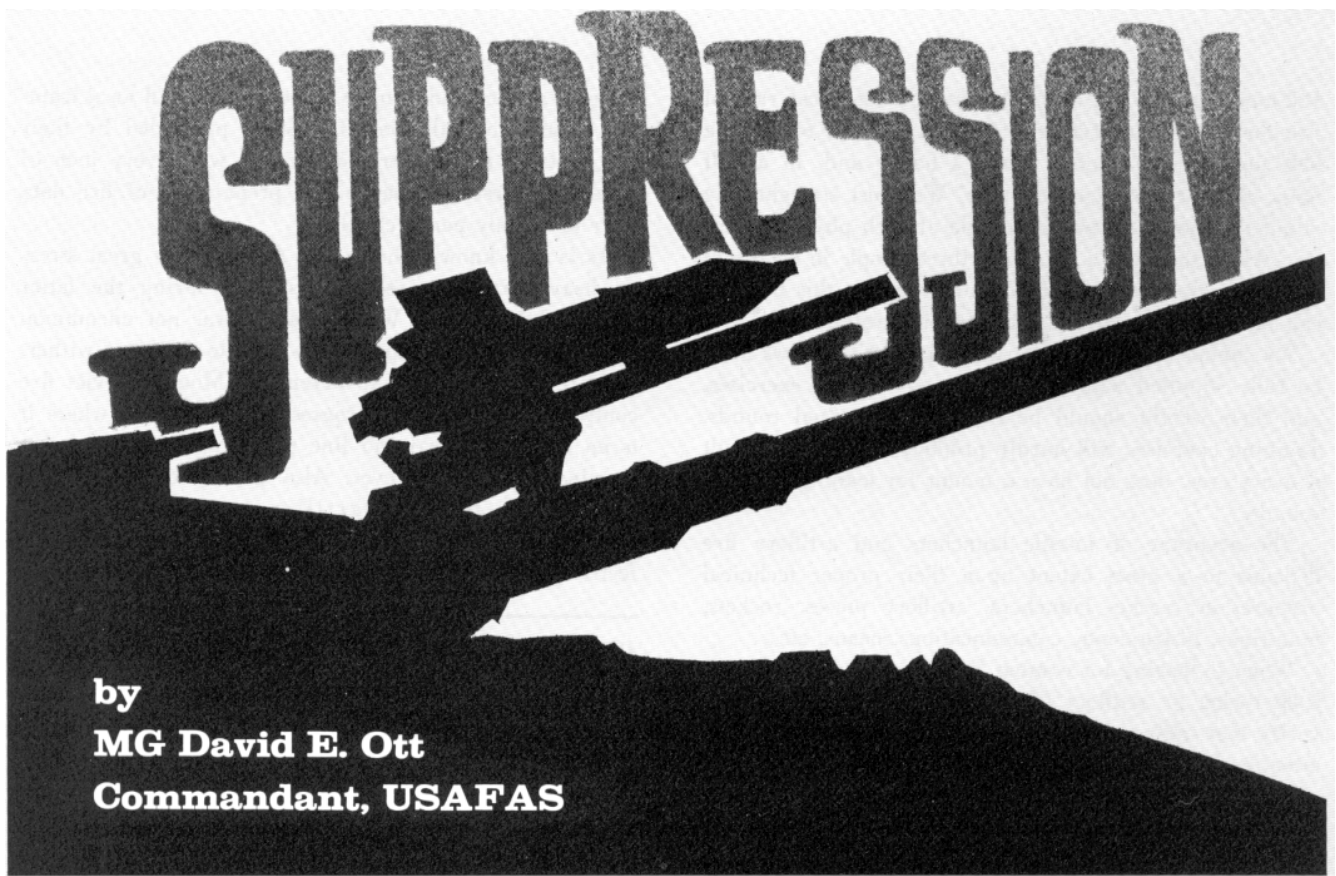
"In the conduct of fire direction, it is important to achieve great accuracy with the first round."

Soviet artillery is mainly towed, with an almost total lack of self-propelled pieces. The guiding philosophy here seems to be that guns cannot be deadlined due to a breakdown in the transpost mechanism and a prime mover of some type can always be found. At battalion and regimental levels, however, the Soviets have made use of some auxiliary-propelled 57- and 85-mm antitank guns, although these weapons are being replaced by antitank ground missiles mounted on BRDM reconnaissance vehicle chassis.

"Accompanying artillery" (*artilleriia soprovozhdeniia*) is peculiar to the Soviet Army; guns up to 152-mm are assigned to front line units to engage enemy strong points or armor by direct fire. Soviet artillery is plentiful—artillerymen constitute about one quarter of the Soviet Army, a rather high percentage in comparison with most other armed forces. During offensive operations, it is not unusual for an artillery battalion to be attached to a motorized rifle battalion (the motorized rifle unit would have an armor company, an engineer platoon and a CBR section attached to it as well).

Soviet forces are equipped with a very wide, diverse inventory of artillery support, ranging from light to heavy mortars and conventional tube artillery to multiple rocket launchers and missiles. Motorized rifle and tank divisions are also equipped with a Free Rocket Over Ground battalion, capable of firing conventional as well as chemical, biological and nuclear rounds.

Soviet artillery, as the most important supporting arm of the combined arms team, is equipped with a variety of modern weapons and is well-trained to operate in a nuclear as well as conventional environment. ☒



Military planners have often been accused of preparing for the next war on the basis of their last combat experience. Although the US Army was quick to shake the mantle of a limited war posture several years ago, the pace in adapting to the realities of modern conventional combat was accelerated by the Yom Kippur War experience. While not directly participating in that conflict, we nonetheless learned much. We no longer needed to rely on fictional scenarios, order of battle handbooks and weapons effects tables to calculate the requirements of future wars. The modern battlefield was in front of us, from Sinai to Golan. The Yom Kippur War tested our current weapons systems against current Soviet systems and gave us an insight into this changed battlefield. We have further refined this knowledge through the Scenario Oriented Recurring Evaluation System (SCORES) scenarios and war games and we must continue to use this experience to the fullest in the development of our current and future doctrine and materiel.

We at the Field Artillery School are using the lessons learned from the Mideast War, the SCORES scenarios and some plain down-to-earth thinking to define our future role on the modern battlefield. The many new tactics and techniques we are developing will make the Field Artillery System more responsive to the needs of maneuver than ever before. Perhaps the most significant of these new

tactics and techniques are those providing for the support of *leading maneuver elements* moving to contact—those elements employing the "overwatch" techniques outlined in General DePuy's *Combat Operations Philosophy* and explained in detail in TC 7-3 recently published by the Infantry School and CATB.

The weapon which has done so much to change our thinking about the modern battlefield is the Antitank Guided Missile (ATGM). Maneuver elements can now expect to be taken under fire by ATGMs at ranges far greater than ever before. Although the main fighting machine on the modern battlefield remains the formidable tank, it is vulnerable. In the Mideast War, very large numbers of armored vehicles were destroyed on both sides. The greatest percentage of this destruction was caused by the ATGM with a proven effective standoff range of over 3,000 meters. Since our current antitank and direct fire weapons are effective only to about 1500-2000 meters, these enemy weapons must be "pinned down" and their effectiveness degraded to allow lead maneuver forces to move against the enemy. That critical 1,500-meter gap between the maximum range of our weapons and the standoff range of the ATGM must be filled by artillery firepower. This pinning down of the enemy at the crucial time in movement to contact is called SUPPRESSION.

Like the ground gaining arms, we have given much

thought to this suppression role. The Field Artillery School, in conjunction with the Infantry and Armor Schools, offers the following definition of suppressive fires:

"Fires, direct and indirect, brought to bear on known or likely enemy locations to degrade the enemy's ability to place effective fire on friendly maneuver elements. Suppressive fires are categorized as immediate or planned."

The somewhat new term *immediate* is needed because there will be times when our forces under fire from enemy direct fire weapons and ATGMs require instantaneous response. Major changes in field artillery procedures will satisfy this requirement. Suppressive fires will often include smoke since the ATGM and the tank gun must see to shoot. We need to train much more on the use of smoke.

We intend to *dedicate* field artillery units to maneuver elements moving to contact. By this, we mean that a battery from the direct support artillery battalion can be dedicated on a one-on-one basis to a leading maneuver element—perhaps a company team—to answer immediate calls for suppressive fire. It will be the maneuver commander's choice as to which of his elements will receive this dedicated support. We visualize that a direct support battalion could provide up to two batteries in this dedicated role—keeping one free for quick response to other elements of the committed force. This special type mission can be expanded with reinforcing artillery.

A dedicated unit will *monitor* the command frequencies of the supported maneuver company for the express purpose of following the tactical situation and answering immediate calls for fire from a particular maneuver element. This will allow infantrymen or tankers to call for fire in emergencies without changing frequencies. All they need know is the artillery call sign. The artillery will not talk on this net unless called by the maneuver element. A thorough understanding of the situation and proper anticipation by the battery FDC will, in some circumstances, permit the guns to be laid on a target and loaded before the mission is sent.

Infantry and armor captains, lieutenants and platoon sergeants will be taught a *simplified system* for calling for and adjusting suppressive fires since we acknowledge that the artillery forward observer will not always be in a position to call for instant artillery fire throughout the company sector. In this connection, the Field Artillery School will furnish the instructional material for this system to the Infantry and Armor Schools where it will be taught in conjunction with their suppression program. In addition, suppressive fire adjustment and capability, to include use of smoke, will be evaluated in the Army Training and Evaluation Program (ARTEP). Because mechanized and armor units frequently cannot give an accurate direction to a target for artillery purposes, we

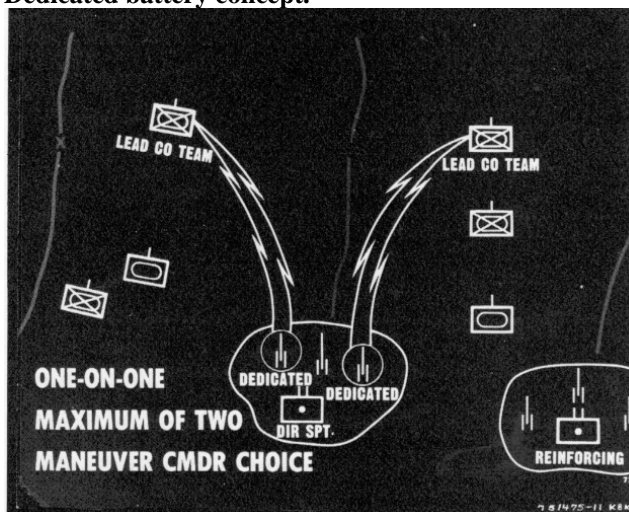
will teach the use of the eight points of the compass for direction to adjust fire. These general directions, hastily calculated, will suffice for rapid suppression.

We will *short circuit* our normal fire direction and firing battery procedures to get rounds from the dedicated battery in the air within 30-45 seconds for immediate suppressive fire missions. As pointed out earlier, this will be accomplished by tracking the progress of the maneuver element by radio, anticipating where the next suppressive target may appear and keeping at least two guns laid on or near that target. Munitions in the loading tray with charges and fuzes cut may be HE, smoke or whatever is required. The point is, we will be ready to strike to provide immediate suppressive fires for lead maneuver elements during those especially critical times when they are moving to contact.

We will ask maneuver units to use a *standard system* of checkpoints, phase lines, boundaries and other control measures, and to furnish these to the dedicated battery for purposes of tracking their progress and identifying targets better. This will mean that company commanders and platoon leaders will not be adding checkpoints or phase lines after the command and control plan has been determined and furnished the artillery. Checkpoints and phase lines should be selected early in the operation to allow as much time as possible for FDC processing.

We will *deviate from normal procedure in planning suppressive fires* and will allow the forward observer to assign target numbers. In a departure from our standard two-letter, four-digit system, these target numbers will be simplified to a letter and a number. Our lieutenants, as well as the maneuver officers, will be taught to use a thrust line method for quick fire planning. This method will consist of two encoded grids with a connecting line and simple coded matrix to designate the location and number of each target with reference to the thrust line.

Dedicated battery concept.



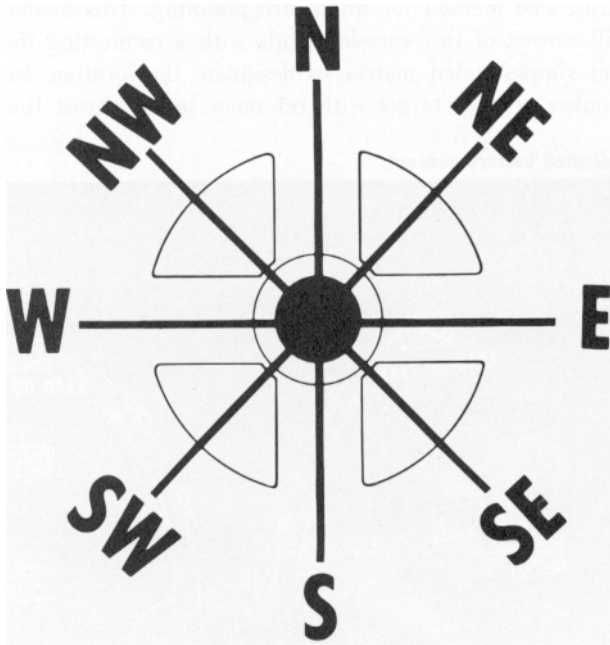
The thrust line normally will be in effect for only a short period. When one phase of the operation is ended, the FO will establish a new thrust line for the next phase. This method of hasty fire planning will provide relatively accurate target data directly to the FDC without the need for physically sending an overlay or encoding and decoding a series of targets. A double-check of the two encoded grids will be simple.

Finally, if necessary we will give up some degree of accuracy in the interest of *speed* for immediate suppression. When maneuver elements come under fire our reaction must be quick and violent. Two 155-mm rounds impacting 2-300 meters from an enemy ATGM gunner will surely cause him some concern, whereas a battalion firing three volleys on target five minutes later might well be too late.

Because the enemy will normally open fire with his ATGMs at longer ranges—up to 3,000 meters when he can see that far—we can expect our initial artillery suppressive fires of HE and smoke to be well in front of our maneuver elements. This will ease some of the pressure for safety and clearances. In addition, our fire direction officers will know the location of friendly elements by having their control plan and monitoring their radio and they can fill in any gaps by talking to the FO.

We recognize that we are putting a great deal of responsibility on our field artillery units which will be engaged in the support of movement to contact operations. The battery commander especially will be under pressure. He will need to be in the FDC when his supported maneuver force is moving to contact. We also realize that we

A quick direction—eight points of the compass.



are talking of a relatively small period of time in the overall battle. Once contact remains established, more traditional methods will suffice for quick responsive fire support. But the fact remains that the movement to contact on the modern battlefield is so crucial to the success of our forces that the suppressive fires I have discussed must be available.

We know that we can provide this support only if we train for it, and train hard. Suppressive fire requires a great deal of coordination between maneuver and fire support—and automatic procedures within the supporting field artillery battery, executed without flaw. To help in this, the Field Artillery School has published a test edition training circular, TC 6-20-1, which details the methods and procedures which need to be mastered if we are to be successful in suppression. Get a copy, read it and learn it—and train your unit in the procedures. These techniques, properly employed, may well spell the difference between winning or losing at a critical time on the modern battlefield.

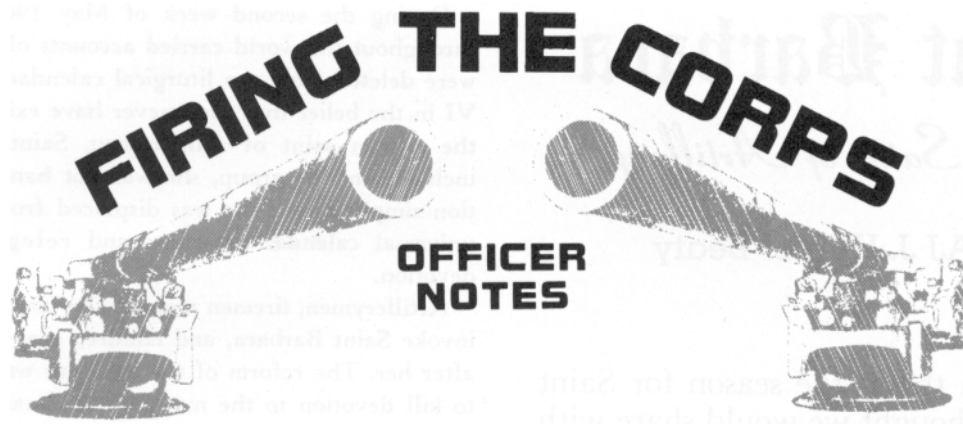
The Field Artillery role in suppression is crucial—there is no second chance in this business. *We are convinced that these new procedures for suppression will work.* ☒



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MOS subject areas to junior enlisted personnel in the field. Initially, these will be in audio-visual teaching machines. The lessons are designed for individual study as an aid to achievement and maintenance of MOS proficiency. They are also adaptable for small group instruction. Each of these lessons is based on the same system engineered task data used to design the primary skill level MOS tests. Additionally, each lesson has proven teaching ability through testing and validation with students selected from field units.

The Field Artillery System can meet the goal of timely, first round fire for effect accuracy with your help. Study the upcoming articles in the **Field Artillery Journal**. Watch for more "Forward Observations." As changes occur, we at the home of the Field Artillery will provide you with the details. The Field Artillery School is staffed to provide leadership in the process of change. Again, however, it can only succeed in this effort with your help. I urge you to seek the highest levels of professionalism by sharing your ideas and concepts, your practical "hands on" solutions to problems and your comments on the effects of change in your working environment. ☒



Redleg Newsletter

At the direction of the Department of the Army, branch newsletters will cease publication. Arrangements have been made to publish Branch information in the **Field Artillery Journal** as a standard Redleg Newsletter feature. The bimonthly "Commanders Update" will be included as a regular portion of this page.

New Branch Chief

COL Benjamin E. Doty has been named to succeed BG William L. Shea as the new Chief of Field Artillery Branch. LTC Jack Ridgeway has been designated interim Branch Chief pending Colonel Doty's scheduled arrival in February 1975. Colonel Doty comes to MILPERCEN from Europe where his latest assignment was commanding the 3d Armored Division Artillery. He is a graduate of the University of Idaho where he was commissioned through the ROTC program. He majored in political science and earned a Masters degree in public administration from Shippensburg State College in 1972. His battalion command includes the 5th Training (Missile) Battalion, USATC at Fort Sill and the 7th Battalion, 11th Artillery, in Vietnam. Colonel Doty's military education includes the Basic and Advanced Courses at the Field Artillery School, Command and General Staff College and the Army War College where he graduated in 1970. A native of Kellogg, ID, Colonel Doty's decorations include the Legion of Merit, the Bronze Star Medal and Meritorious Service Medal with oak leaf clusters, the Air Medal with two oak leaf clusters and the Army Commendation Medal with three oak leaf clusters. General Shea has been reassigned to Fort Leonard Wood, MO, as the deputy commander.

OPMS Milestones

Letters requesting alternate specialty preferences were mailed to officers on the current 05 list in early September. Preferences (inclosure to the letter) should have been returned to Branch by 31 October 1974. Designation of alternate specialties for these officers should be completed by end December 74.

Alternate specialty preference sheets were distributed through command channels to majors and promotable captains in early September. These preference sheets should have been returned to Branch by 31 October 1974. Designation of alternate specialties for majors should be completed by end March 75.

Centralized Command Selection Boards for 05s are scheduled to convene in mid-January 75. Results should be announced in a DA circular by May 75. Information on selection/nonselection will not be made available by Branch until the circular is released.

Mailing Address

The coming months will be important in the professional development of many field artillery officers; e.g., alternate specialty designation for majors and command selection for lieutenant colonels. Branch needs a current viable mailing address. Since much correspondence is prepared with assistance of the computer, it is essential that the mailing address currently maintained in each officer master file be accurate. If you have not recently done so, visit your personnel officer and check item 25 of the DA Form 2-1 (or item 33 of the DA Form 66). Insure that this is a current mailing address!

UPDATE

Senior Field Artillery Commanders

LTC James W. Doukas
1st Battalion, 7th Artillery

LTC Robert D. Chelberg
1st Battalion, 14th Artillery

LTC Thomas D. Reese
2d Battalion, 17th Artillery

LTC William L. Hughes
2d Battalion, 75th Artillery

LTC George H. Thompson
3d Battalion, 319th Artillery

Saint Barbara

Patron Saint of Artillery

by MAJ J. Hunter Beaty

In as much this is the season for Saint Barbara, we thought we would share with you what we believe to be one of the best and most interesting essays on the Patron Saint of all Redlegs—Saint Barbara. It is also of interest that just over a year ago MG David E. Ott, Commandant of the Field Artillery School, authorized the award of the Ancient Order of Saint Barbara. The decoration, which consists of a medallion with red ribbon and a certificate, is awarded to staff and faculty members for faithful service to the Field Artillery School. The Ancient Order of Saint Barbara may be given to any officer of the US Army, Marine Corps, as well as exchange and liaison officers from foreign services who have completed at least one year of service in the school. The medallion is worn as a permanent part of the uniform or civilian dress during appropriate social occasions.—Ed.



During the second week of May 1969, newspapers throughout the world carried accounts of 30 saints who were deleted from the liturgical calendar by Pope Paul VI in the belief they may never have existed. Although the patron saint of artillerymen, Saint Barbara, was included in this group, she was not banned. The deletion simply meant she was displaced from the Catholic universal calendar of saints and relegated to local devotion.

Artillerymen, firemen and military architects may still invoke Saint Barbara, and children may still be named after her. The reform of the calendar was not intended to kill devotion to the many popular saints familiar to the Christian world for centuries. Even if Saint Barbara's name no longer appears in newer Catholic calendars, she is still commemorated on definite days in *Roman Martyrology*, a liturgical book in its own right.

The liturgist who worked on the Catholic Church calendar in 1969 did so with a mandate from the Vatican Council to give precedence to the mysteries of Christ's Passion and death over the celebration of saints' feast days. The criteria for the selection of saints to be included in the calendar, according to Father Annibale Bugnini, secretary of the Congregation for Divine Worship, was: "geographical universality . . . commonality of Christian life . . . representativeness of Christian life . . . distribution among the centuries and . . . current devotion." Father Bugnini indicated that the saints discarded, in the process of selection, may be adopted in local calendars. He further argued that it was incorrect to make obligatory in Japan or in Africa saints who, in fact, have devotees only in Italy or Spain.

Pope Paul VI approved the new organization of the Catholic Church's liturgical year and its new calendar. The new calendar was made public in May 1969 and became effective 1 January 1970. The revision of the liturgical year and the norms which follow from this restoration, Pope Paul wrote, ". . . have no other purpose than to permit the faithful to communicate in a more intense way, through faith, hope and love, in the whole mystery of Christ which . . . unfolds within the cycle of a year."

The effect of Pope Paul's approval of the new calendar was not to reduce the number of saints, but to reduce the number of saints who are honored throughout the Catholic Church.

Christmas season

Saint Barbara's Day is considered the real beginning of the Christmas season in Syria and in parts of France and Germany. In southern France the women in every house fill two and sometimes three plates with wheat or lentils, and then stand them in the warm ashes of the



fireplace or on a sunny window ledge to germinate. The harvest of the coming year will be good or bad as Saint Barbara's grain grows well or bad. At what is known as the Great Supper on Christmas Eve, the table is decorated with the growing grain as a symbol of the harvest that is to be.

Servian farmers, on the eve of this saint's feast, boil all sorts of grain together in the same pot, leaving the pot near the fire during the night. The next morning they carefully observe on which side the boiling has most swelled the grain, and on this indication, they sow the fields which extend in that direction.

English version

"The Golden Legend," a collection of accounts of

saints' lives, was written by the 13th century author Jacopo de Voragine (1230-1298). The first printed editions contain accounts of the lives of saints introduced after the 13th century.

The first known English edition was printed in 1483 by Wyllyam Caxton (1422-1491) in London. This edition was printed from a version written some 20 years before and omits some of the less credible aspects of legends found in the original. The publication was "funded" by the Earl of Arudel, agreeing to take "a reasonable number of copies" and pay as an annuity "a buck in the summer and a doe in the winter."

It is Caxton's version of "The Golden Legend" which is considered the most authoritative English source of information about Saint Barbara, patroness of artillerymen, military architects and firemen . . . those facing sudden death.

Saint Barbara (Ste. Barbe, Santa Barbara, S. Barbarae) was a virgin martyr of the early Catholic Church. The legend, which is no older than the seventh century, holds that she was the daughter of a pagan, Dioscorus, who kept her guarded in a tower. When she acknowledged her acceptance of Christianity, her father took her to the prefect (civil magistrate) of the province to be tortured and beheaded. Having caused her unjust death, Dioscorus was killed by a bolt of lightning that so completely consumed his body only ashes remained.

Most authors agree Saint Barbara is venerated as one of the 14 Auxiliary Saints (Holy Helpers). Her story was quite popular during the Middle Ages. Caxton's account (as quoted in Butler's "Lives of the Saints") is given here:

"In the time that Maximian reigned there was a rich man, a paynim [pagan] which adored and worshipped idols, which man was named Dioscorus. This Dioscorus had a young daughter which was named Barbara, for whom he did make a high and strong tower in which he did keep and close this Barbara to the end that no man should see her because of her great beauty. Then came many princes unto the same Dioscorus for to treat with him for the marriage of his daughter, which went anon unto her and said: 'My daughter, certain princes be come to me which require me for to have thee in marriage, wherefore tell to me thine intent and what will ye have to do.' Then St. Barbara returned all angry towards her father and said: 'My father, I pray you that ye will not constrain me to marry, for thereto I have no will nor thought . . .' After this he departed thence and went into a far country where he long sojourned.

"Then St. Barbara, the handmaid of our Lord



(Photo by Jacqueline Snyder)

Jesu Crist [sic], descended from the tower for to come to see a bath-house which her father was having built and anon she perceived that there were but two windows only, that one against the south, and that other against the north, whereof she was much abashed and amarvelled, and demanded of the workmen why they had not made no more windows, and they answered that her father had so commanded and ordained. Then St. Barbara said to them: 'Make me here another window.' . . . In this same bath-house was this holy maid baptized of a holy man, and lived there a certain space of time, taking only for her refection honeysuckles and locusts, following the holy precursor of our Lord, St. John Baptist. This bathhouse is like to the fountain of Siloe, in which he that was born blind recovered there his sight. . . . On a time this blessed maid went upon the tower and there she beheld the idols to which her father sacrificed and worshipped, and suddenly she received the Holy Ghost and became marvellously subtile and clear in the love of Jesu Christ, for which she was environed with the Grace of God Almighty, of sovereign glory and pure chastity. This holy maid Barbara, adorned with faith, surmounted the Devil, for when she beheld the idols she scratched them in their visages, despising them all and saying: 'All they be made like unto you which have made you to err, and all them that have faith in you'; and then she went into the tower and worshipped our Lord.

"And when the work was full performed her father returned from his voyage, and when he saw there three windows he demanded of the workmen: 'Wherefore have ye made three windows?' And they answered: 'Your daughter hath commanded so.' Then he made his daughter to come afore him and demanded her why she had to make three windows, and she answered to him and said: 'I

have done them to be made because three windows lighten all the world and all creatures, but two make darkness.' Then her father took her and went down into the bath-house, demanding her how three windows gave more light than two. And St. Barbara answered: 'These three windows betoken clearly the Father, the Son and the Holy Ghost, the which be three persons and one very God, on whom we ought to believe and worship.' Then he, being replenished with fury, incontinent drew his sword to have slain her, but the holy virgin made her prayer and then marvellously she was taken away in a stone and borne into a mountain on which two shepherds kept their sheep, the which saw her fly. . . . And then her father took her by the hair and drew her down from the mountain and shut her fast in prison. . . . Then sat the judge in judgement, and when he saw the great beauty of Barbara he said to her: 'Now choose whether ye will spare yourself and offer to the gods, or else die by cruel torments.' St. Barbara answered to him: 'I offer myself to God, Jesu Christ, the which hath created Heaven and earth and all other things. . . .'

"When she had been beaten, and comforted by a vision of our Lord in her prison, and again scourged and tortured the judge commanded to slay her with the sword. And her father, all enraged, took her out of the hands of the judge and led her up on a mountain, and St. Barbara rejoiced in hastening to receive the salary of her victory. And then when she was drawn thither she made her orison, saying: 'Lord Jesu Christ, which hast formed Heaven and earth, I beseech thee to grant me thy grace and hear my prayer for all they that have memory of thy name and my passion; I pray thee, that thou wilt not remember their sins, for thou knowest our fragility.' Then came there a voice down from Heaven saying unto her: 'Come, my spouse Barbara, and rest in the chamber of God my Father which is in Heaven, and I grant to thee that thou hast required of me.' And when this was said, she came to her father and received the end of her martyrdom, with St. Juliana. But when her father descended from the mountain, a fire from Heaven descended on him, and consumed him in such wise that there could not be found only ashes of all his body. This blessed virgin, St. Barbara, received martyrdom with St. Juliana the second nones of December. A noble man called Valentine buried the bodies of these two martyrs, and laid them in a little town in which many miracles were showed in praise and glory of God Almighty."

So is told Caxton's version of the story of Saint Barbara. In the telling, however, there appears a void of authoritative information regarding the "when" and "where" of the legend.

Ste. Barbara's day

Caxton's account states that Saint Barbara received martyrdom the "second nones of December." Nones is defined in the ancient Roman calendar as the ninth day before ides (ides being the first day) or the seventh of March, May, July and October, and the fifth of the other months. "Second nones" is thus the second day before nones, so she met her death December 4. In the English calendar of the late ninth century, Saint Barbara's name is found under December 4.

The year of Saint Barbara's death was either under the rule of Maximinus (235-238) or 60 to 70 years later under Maximianus or Galerius. The exact date cannot be determined, but December 4, AD 235 is most favored by authorities in the field. In ancient Roman history, Maximianus I was co-emperor with Diosletian (285-305), and persecution of Christians on a large scale occurred between 303-313. Thus, Saint Barbara's death could have been at the turn of the century or around 303-305 AD. Since there is some discrepancy on this point, perhaps the most accurate statement is that Saint Barbara was martyred on December 4, approximately 300 AD.

Versions of the legend differ as to the place of the martyrdom. One author asserts that he finds references as to locations being in Tuscany, Rome, Antioch, Heliopolis and Nicomedia. Another states that "Heliopolis is as plausible a locality as Tuscany or Nicomedia, which are alternatively suggested." Still another source indicates the scene of the execution to have been in Nicomedia (in Bithynia), Tuscia (i.e., Etruria), or Heliopolis in Egypt; while a fourth asserts that Saint Barbara lived and died at Nicomedia. The fixing of the place of Saint Barbara's suffering is as arbitrary as the exact date she died. However, by arbitrary decision, it is concluded that Saint Barbara probably lived and died at Nicomedia in Bithynia on the southern bank of the Dead Sea. As a minimum, most authors agree on this locality as one of the possibilities.

There is an eighth century fresco (plaster painting) of Saint Barbara in Rome. Her vita (description) was taken from the *Menologian* of Symeon Metaphrastes and introduced into European martyrologies in the ninth century. She is listed as one of the 14 Holy Helpers and the patroness of those exposed to sudden death. She is portrayed with a crown, palm, sword, tower, peacock and a chalice which symbolized a happy death, and was the subject of many Flemish and Italian artists in the 15th and 16th centuries.


Saint Barbara is invoked against lightning and fire.

Early artillery weapons exploded frequently and the gunners were in constant danger from their own guns. By analogy, Saint Barbara became the special protector of these men, since her fate of sudden death was their everyday companion. As patroness of artillery, her image was at one time frequently placed on artillery arsenals, powder magazines, etc. The powder room in a French ship of war is to this day called "Sainte-Barbe." This devotion is partly attributed to the nature of the fate that overtook her father. The tower represented in her pictures, and her directions to the builders of the bathhouse, have caused her to be regarded as a patroness of architects, builders and stonemasons. Her prayer before her execution accounts for the belief that she is a special protectress of those in danger of death without the sacraments. All of these functions have been accepted as historically true. No mention is made of this saint in any of the authoritative writings of her time, but by the seventh century she was firmly established in the hearts of many Christians.

Caxton's account of the legend requires interpretation relating the fatal blow that rendered Saint Barbara a martyr. One interpretation says Dioscorus was struck by lightning as he was about to behead his daughter. The other says he did behead her and was killed by lightning on his way home. All accounts agree that the blast from the sky not only killed him, but completely consumed his body, leaving only traces of ash. This portion of the story explains why Barbara is invoked against lightning, storms and sudden death.

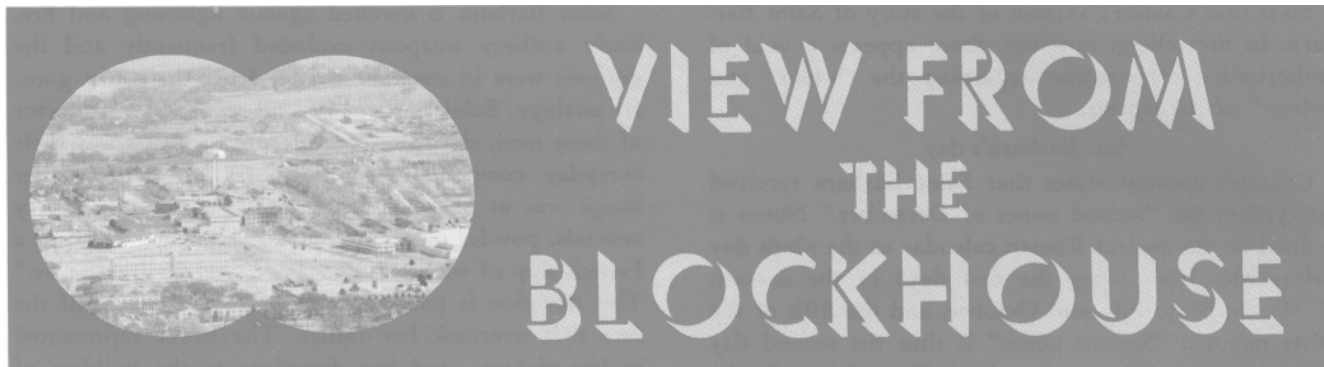
An event in the year 1448 gave additional support to the belief that Saint Barbara looks after those who are stricken suddenly. "A man named Henry Kock, in the town of Garkum, was trapped in his burning house and burned beyond all hope. He prayed to Saint Barbara and through her intercessions was kept alive long enough to receive the Sacraments." The reports of Kock's experience was circulated widely and Barbara's popularity as the protector of the dying was greatly increased. It was at this time she became the patron saint of firemen.

Patroness

The legends of man (based on truth or fantasy) live down through the ages, enriching culture and enlivening history. Whether fact, fiction or a combination of both, Saint Barbara remains the patroness of artillerymen worldwide. 

MAJ J. Hunter Beaty, FA, is presently serving as chief of the Field Support Division, Army-Wide Training Support Department, USAFAS, Fort Sill, OK.

Notes from the School



SIAGL Slated To Replace ABLE

The Survey Instrument Azimuth Gyro Lightweight (SIAGL) is a manportable north-seeking gyroscope capable of determining true north within field artillery accuracy requirements without using celestial or landmark sightings. The instrument was developed to replace the survey instrument, azimuth gyro (ABLE). The SIAGL was developed by the US Army Engineer Topographic Laboratories with Astronics Division of Lear Siegler, Inc., as prime contractor.

The system is presently undergoing preproduction test at the contractor facility. The SIAGL is to replace the present ABLE on an item-for-item basis and will be issued to all headquarters and headquarters batteries of the infantry, armored, mechanized and airborne division artillery, all field artillery target acquisition batteries and to most field artillery battalions. The fielding of SIAGL will provide the field artillery the capability of determining rapid, accurate azimuth for survey, fire direction and target acquisition purposes.



The SIAGL in operational set-up for preproduction testing.

SOFAR

The Army-Wide Training Support Department of USAFAS has established a nonresident refresher course for field-grade officers—the Senior Officer Field Artillery Refresher Correspondence Course (SOFAR).

SOFAR consists of 11 subcourses totalling 82 credit hours and focuses on the broad fundamental aspects of branch tactical operations. Its coverage includes fire support coordination, fire planning, fire direction, target acquisition, communications, organization and employment since operations can be significantly effected by doctrinal changes in these areas.

The course also includes supplementary reference materials of particular interest to field artillerymen: training circulars, USAFAS handbooks and notes on maintenance, material, tactical operations and future trends.

Officers with highly specialized needs may continue to enroll for the specific subcourses they require independent of the course. Thus, a lieutenant colonel assigned to a division artillery from the Pentagon may choose to take the Nuclear Target Analyst Refresher Course and certain gunnery subcourses in addition to the "broad brush" SOFAR.

Majors and above who completed a Field Artillery Officers Advanced Course at least three years prior to enrollment are eligible for this course. Interested officers should

SIAGL CHARACTERISTICS	
ACCURACY.....	± .15 MILS AT MID-LATITUDES
WEIGHT.....	50 POUNDS WITHOUT POWER
	SOURCE AND STANDARD TRIPOD
AZIMUTH DETERMINATION TIME.....	25 MINUTES
POWER SOURCE.....	24 VOLT NI-CAD BATTERY
	24 VOLT VEHICLE BATTERY
	110 VOLT AC USING CONVERTER
CONFIGURATION.....	GYROSCOPIC ASSEMBLY
	INTEGRAL THEODOLITE,
	ELECTRONIC CONTROL UNIT, TRIPOD,
	CABLES AND TRANSPORT CASES
AREA OF OPERATION.....	75° NORTH LATITUDE TO
	75° SOUTH LATITUDE

send a completed DA Form 145, Army Correspondence Course Enrollment Application, to the Commandant, US Army Field Artillery School, ATTN: ATSF-AW-AP, Fort Sill, OK 73503.

New Pershing Systems Tested

The Automatic Reference System (ARS) and the Sequential Launch Adapter (SLA)—latest developments in Pershing PIA Missile System—have been tested on Fort Sill's ranges by a platoon from C Battery, 3d Battalion, 9th FA, under supervision of the Field Artillery Board.

Appearing like a gigantic microscope, the ARS is actually a sophisticated north-seeking gyro and laser that finds true north and shoots a laser beam to the missile guidance section.

Using the laser and direction of fire from the computer in the Programmer Test Station (PTS), the ARS points the guidance section toward the target in less than half the time normally required—without human error.

With cables draped everywhere, the SLA looks like a mechanical octopus. However, it is a tailored junction box allowing up to three missiles to be connected into one PTS and counted in a series. The present Pershing system requires the PTS to move to each missile, wasting valuable time.

Each missile has 120 feet of cable weighing 1,300 pounds. This proved quite a task for crewmen to maneuver in Oklahoma's then soaring temperatures.

The specialized unit spent June at Martin Marietta Corporation in Orlando, FL, learning how to adopt ARSSLA into the Pershing system.

Since there is only one instrument to emplace and its operation is automatic, azimuth laying personnel found their task nearly eliminated by the ARS. In the meantime, Pershing's crewmen became musclemen as they squeezed 3,900 pounds of cable on the Erector Launchers.

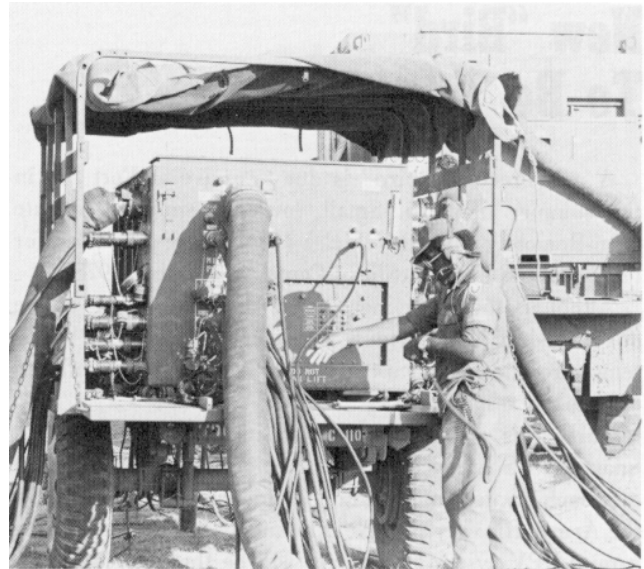
One purpose of the testing was to insure ARSSLA can stand the strain, prove feasible for use in Germany and establish correct emplacement procedures.

A typical testing session followed this schedule:

- By 0600 preparations for testing had already begun. Maintenance was pulled for one hour, trucks were moved into position and the platoon quickly assembled the intricate Pershing system.

- By 0900 three missiles had been counted and were ready to fire. The platoon was put on stand-by. Shortly afterward, a fire mission horn sounded and crewmen scrambled to their positions for a quick count. The missiles

View from the Blockhouse



Signals from SLA through 360 feet of cable are monitored by SSG Rae Cunningham, Field Artillery Board. The cables are lifelines from the PTS to three Pershing missiles, enabling all three to quick count and fire in less than 18 minutes. (Photo by SP4 Michael Inouye)

erected and simulated liftoff, then were recaptured and march ordered.

- After lunch the position was moved and the testing resumed, often into night.

Field testing ended in September and C Battery was scheduled to fire two ARS-SLA missiles from Fort Bliss, TX, to White Sands Missile Range, NM, in October. The Field Artillery Board is now evaluating test results.

Poised and ready, Pershing undergoes ARS-SLA testing. (Photo by SP4 Chris Sheriff)



View from the Blockhouse

New "Bird" To Be Tested

A new breed of "bird" is due to arrive at Fort Sill in the summer of 1975. Small, low-cost, simple-to-operate mini-Remotely Piloted Vehicles (RPVs) are scheduled for testing at the Field Artillery Center in October 1975.

Although the need met by RPVs (the ability to see "over-the-hill") is obvious, previously proposed RPV systems have been too costly, too sophisticated and offered only token results.

Early this year, the Commanding General of Headquarters, US Army TRADOC, decided to take a different approach in developing and fielding an RPV system for the Army. His very positive guidance was: "In developing a mini-RPV system, *simplicity* will be the overriding objective. Thus, any guideline which cannot be readily satisfied with a simple program should be deleted from the list."

He subsequently stated that the great enemy of RPVs included prohibitive costs stemming from complexity and long developmental lead time. He also pointed out that TRADOC is convinced that a reasonable, simple, "over-the-hill" capability can be developed rapidly and at low cost. He further stated that TRADOC and AMC Headquarters will work closely on design characteristics of the next generation prototypes to establish early requirements, or as he termed them, "the little 'r'." This is a method of developing the product to fly before it is purchased. In short—we will not wait for all requirements to be identified in the development cycle. Rather, "off-the-shelf" items are utilized and experiments are conducted at very low costs to determine actual requirements and current state-of-the-art.

In August 1974, after numerous conferences and discussions on the RPV program, USAFAS was designated as the TRADOC user proponent, having the proponenty to represent all US Army users.

The initial action was to appoint COL Alonzo Kretzer as Task Force Director for the RPV experiment program. The colonel immediately organized his task force with four full-time members from different school departments. He further identified on-call members from the Center as well as representatives from all other interested schools and agencies. The first RPV Task Force meeting was held 20-23 August. At the meeting, hosted by USAFAS, the RPV experiment was identified and the entire RPV program was briefed.

The experiment program is now on its way. Some highlights of the milestone schedule follow. The contract letting deadline was 29 October for the procurement of 30 mini-RPVs. Very little can be stated now about the

characteristics of these RPVs except that they will be simple and inexpensive, having a navigation system which will allow them to be flown to a predetermined location with ranges of about 25 kilometers. Additional characteristics of the RPV system will provide different sensor equipment which will include: photography, video (real time data link), laser ranging and laser designation.

These RPVs and their associated equipment are due to arrive here August 1975. In October 1975, the School will start the TRADOC experiment for the RPV program. The experiment will be conducted in five phases with each phase approximately four months in duration. The phases are: Phase I, surveillance; Phase II, photographic reconnaissance; Phase III, target acquisition; Phase IV, target location and artillery adjustment; and Phase V, laser designation. The experiment will be completed by June 1976.

Threat Instruction

"Threat" instruction for Field Artillery Officer Advanced and Officer Basic Course students has received new emphasis. The organization, strength, tactics, weapons and target acquisition capabilities of foreign ground forces are discussed in terms of how they would affect field artillerymen supporting maneuver forces at the company (FO), battalion (FSO) and brigade (DS) levels. As an integral part of the threat class, a seminar is used to identify the operations security measures that a US Field Artillery unit can take to increase its survivability on the modern battlefield. The instruction stresses specific vulnerabilities of weapons, limitations in tactical doctrine and weaknesses of the individual soldier that can be exploited.

Members of the next Officer Advanced Course (Jan 1975) will attend one day of conferences on threat, as opposed to receiving the material piecemeal throughout the course. This instruction will be scheduled early in the course so that the information on foreign armies can provide a basis for later classes on gunnery, maneuver forces, artillery tactics and target acquisition.

The Officer Basic Course began receiving a brief, but similar package of threat instruction in November 1974. Prior to this, the basic students did not receive classes on foreign armies.

A handout which highlights the capabilities of selected foreign equipment has been prepared from unclassified publications and is given to the students. The classroom instruction, plus the handout, should give the students enough basic threat data to initiate or update a training program in their next units. For example, the accompanying table reflects information available on Soviet-produced rocket and artillery weapons that are found in a number of foreign armies.

View from the Blockhouse

The following data on these Soviet rocket and artillery weapons is listed for general information. Only the latest models of each weapon are identified. There are many different models of the same caliber weapon found in a number of foreign armies; therefore, the data should be

used on a selective basis. Also, there are several inconsistencies between various publications on the exact capabilities of each weapon. The ranges shown are believed to be accurate, but characteristics such as rate of fire and basic load may vary.

Soviet Weapons							
Caliber	Model	Max Range (meters)	Wt Proj (lbs)	Max Rate of Fire (rpm)	Crew	Traverse (degrees)	Basic Load
122-mm How	D-30	15,300	48	6-8	7	360	120
152-mm Gun-How ..	D-20	17,200	96	3-4	10	58	90
130-mm Gun.....	M-46	27,000	74	5-6	9	50	105
100-mm AT Gun.....	T-12	8,500	21	10	6	54	90
122-mm MRL.....	BM-21	20,500	140	40	6	200	120
FROG 7*.....	(549-mm)	60-70,000	Over 1,000 (warhead)	4/Lchr
120-mm Mortar.....	M-1943	5,700	35	15	6	8	120

* Conventional or nuclear warhead

13E20 Training

Mr. Battery Commander, you probably have noticed that the 13E20 AIT graduate now being sent to your unit from the Field Artillery School has changed in the past year or so. The volunteer concept has resulted in a new type of soldier to train as a Field Artillery Cannon Operations and Fire Direction Assistant. Mostly high school graduates, these soldiers are eager to learn and are looking forward to joining your unit. However, they differ from past AIT graduates in that they are younger, are in the Army by choice and have less formal education.

quality FDC members. Today's trainee has the potential to fulfill that need; it's just a matter of how best to develop that potential and maintain the same high quality 13E required to accomplish the mission. To do this, a joint effort is needed between the commander and the trainers at Fort Sill.

Some adjustments have been made in the gunnery training presented to the student during his seven weeks of AIT. The goal is to provide a soldier with a good, solid foundation in fundamental gunnery skills. But this does not make him an expert. He needs supervision and experience, on-the-job training—your training—before he's completely qualified.

To better prepare the student, Gunnery has implemented several innovations to his MOS training. Those who need help in math are given 12 hours of remedial training oriented toward basic artillery computations. His learning is reinforced by two additional field problems—the well-known "shack shoots"—so that he can see the results of his computations in the impact area. He now participates in four of these live fire shack shoots. The scope of his training on the FADAC has been

improved by eliminating some highly sophisticated techniques and reinforcing his instruction on the computations of basic-type missions. The procedures in his class on high burst (HB) registration have been reduced to the graphic intersection method for locating the HB point; he can now spend more time in practical work and reinforcement to fully understand how to graphically intersect the HB point and to determine corrections.

He will also come to your unit with a good knowledge of recent changes in artillery doctrine . . . like the ABCA registration. Gunnery started teaching this to AITs on 1 October 1974. He's also using the one-gun adjustment concept and is experienced in computations for the M109A1 howitzer since it is the standard weapon used in gunnery instruction.

When the graduate joins your unit he is qualified in the use of firing charts, computation of firing data, determination and application of registration and met corrections, high angle fire, computation of data for white phosphorus and illuminating projectiles and the use of FADAC to compute firing data and apply registration and met corrections for predicted fire.

However, to become a fully qualified 13E20, he will have to be trained by his new unit in such specialized techniques as nuclear delivery, replot, ICM firing data, sheaf corrections and use of logarithms to compute HB/MPI location.

So you see, there is still a good deal of training he needs after he gets to your unit. He has proven his willingness and ability to learn at Fort Sill. All that remains is continue to build on that foundation until you have polished your 13E20s into the finished product you need in your FDC.

feature from the school



Let's Shoot, Lieutenant

"Let's shoot! To identify an antitank gun emplacing—from Marker Signal Mountain go right 90 mils and at that point down from the skyline 11 mils—this will place you on a large rusty car body—that is your adjusting point—prepare your call for fire."

To any Field Artillery Officer Basic Course (OBC) graduate of days gone by, these words from a gunnery instructor are as familiar as Marker Signal Mountain itself. However, that disciplined method of target identification has given way to a more informal method which has been fully implemented for OBC 5-75 beginning in November 1974.

In the past, the majority of OBC service practices were conducted from a stationary observation post (OP). The students were briefed prior to the service practice as to OP location, given a reference point diagram and necessary data to orient their observed fire fans. There was little or no time allotted for map and terrain analysis, preparation of terrain sketches, fire planning or giving the students detailed realistic tactical situations. As a result, observed fire training lacked realism. The typical OBC graduate could adjust artillery fire from a static OP location; however, any variation from that routine placed the student in an unfamiliar situation.

The current Field Artillery OBC program of instruction (POI) has been designed to prepare the newly-assigned artillery lieutenant to perform, in order of priority, the following artillery battery functions: forward observer (FO), battery fire direction officer (FDO) and firing battery executive (XO).

To prepare the OBC student to perform his primary duty, that of forward observation, the syllabus has been modified to provide more classroom instruction in observer-related subjects, create a more realistic environment by placing him in a variety of situations during field exercises, build confidence and encourage flexibility.

The OBC lieutenant's FO training begins in the classroom. During the course, he receives 23 periods of classroom instruction on target location, the call for fire, artillery adjustment procedures and additional instruction to reinforce and amplify his basic knowledge of observed fire (OF) procedures. Included in this reinforcement instruction are techniques to engage moving targets, establish smoke screens, use improved conventional munitions (ICM) and employ illuminating projectiles. Prior to a live shoot, the student participates in a practical exercise using the "puff-board" terrain model.

The next step is participation in a service practice. This encounter with live firing will be from a stationary OP conducted in an instructor-controlled environment on the 14.5-mm artillery trainer range. Upon arrival at the OP, the lieutenant will be given a tactical situation in which his instructor will portray the company commander of the supported unit. Prior to adjusting any artillery, the student will conduct a map and terrain analysis: he will be required to determine his location, pick any reference points he desires to use, become familiar with the terrain in front of him and associate that terrain with his map. Emphasis is on teaching the student to follow established techniques in adjusting artillery fire. The student will not be graded on his ability to adjust artillery fire on this service practice. All other shoots will be graded and, as the student

View from the Blockhouse

progresses through his OF training, the instructor will become more critical of his ability to adjust artillery fire.

Next comes the first full caliber service practice. This shoot, as in the 14.5-mm shoot, will be from a stationary OP. A tactical situation will be given, a map and terrain analysis made and reference points, if desired by the student, will be determined. The instructor will represent the maneuver company commander and will do so on all OF shoots. Prior to firing the first mission, the student will prepare a hasty fire plan to locate three targets. The target location will be graded. The map and terrain analysis and hasty fire planning forces the student to use his map, eliminating dependence on predetermined data, to prepare him to support the maneuver element. Being proficient in map reading is a must for the student since this is the last shoot (with the exception of an illumination shoot and a bunker shoot) using an OP. From this time, he will either be walking, riding or flying.

To build confidence and teach artillery adjustment in a danger close situation, the student's next step in learning to be an artillery observer is a service practice from a bunker. Here he can gain the experience of adjusting artillery fire to within 100 meters of his location, much as he would have to in combat if his supported unit had to repel an attacking enemy force.

Following the bunker shoot the student participates in two "walking" shoots. He is placed in an offensive tactical situation, orients himself, conducts his map and terrain study and begins to acquire targets (hasty fire plan) as the instructor develops the tactical situation. After completion of a mission, the student moves from the start point to as many OPs as possible during the exercise. This enables him to observe the change in perspective of a given piece of terrain even with slow movement and short distances.

To teach the employment of artillery fires in a fast moving tactical situation, a mobile shoot using tanks and APCs as the observer's means of transportation is conducted. Again, the student must make a map and terrain study and do his hasty fire planning. This, by far, is the most challenging shoot. It provides a variety of FO experiences. Operating from the commander's hatch, the student must make a continual map and terrain study, send his own radio transmissions, be versatile in determining the observer-target direction or adjust using the gun-target line method engagement, and control the movement of his tank or APC. As a result of continuous movement, the observer may lose sight of the target area. This will test his competence as an observer and his ability to relocate his target to continue his mission. Even though this exercise is difficult, those participating have been enthusiastic about its value in learning FO techniques.

The majority of students will have the opportunity to


adjust artillery fire from an OH58 helicopter. This will give them entirely different perspectives of terrain features. Those students not fortunate enough to adjust artillery fire from the air will participate in another walking shoot.

A split shoot with firing battery is used to teach the OBC lieutenant the techniques of tactically occupying an OP to include the remoting of his radios.

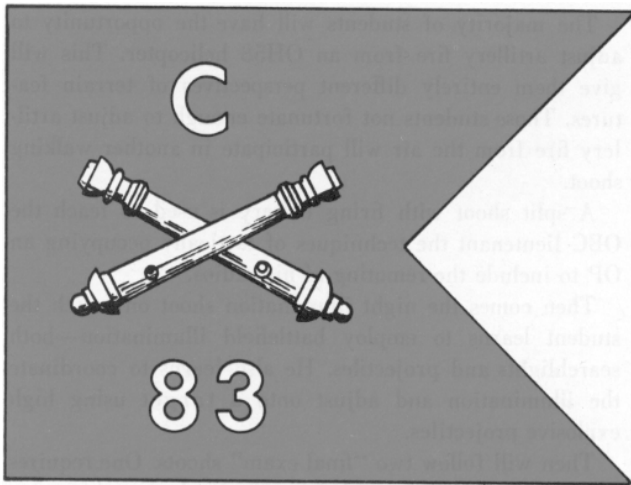
Then comes the night illumination shoot on which the student learns to employ battlefield illumination—both searchlights and projectiles. He also learns to coordinate the illumination and adjust onto a target using high explosive projectiles.

Then will follow two "final exam" shoots. One requires the FO to engage multiple targets simultaneously and a final (second) mobile shoot operating from tanks and APCs.

As currently designed, OF instruction and training is more inclusive, more challenging and certainly more realistic than in the past. Throughout training the student is forced to rely on his knowledge and ability to employ artillery in varying situations. He is required to call for suppressive fires in conjunction with his hasty fire planning while in a fast moving tactical situation. "Dissipating" targets representing the firing of an antitank missile or gun are injected into several different shoots. He also learns to employ smoke in offensive and defensive situations.

Upon completion of OBC, the student is more competent, more flexible and has greater appreciation of the varying situations he is likely to encounter when providing fire support to the maneuver elements of the modern battlefield. 





Company E, 1st Battalion, 29th Infantry



"UNIQUE AND UNCONVENTIONAL" help to describe Company E as what may be the most unusual cannon unit in the US Army today. Activated as a TDA unit to provide field artillery demonstrations and fire support for the United States Army Infantry School, Fort Benning, GA, the unit is unparalleled in three distinct ways: first, it is part of an infantry battalion, the 1st Battalion, 29th Infantry; second, it is approximately two-thirds the size of an FA battalion; and third, it is the only active field artillery unit officially known as a company.

Activated on 21 March 1973 as C Battery (Composite), 83d Field Artillery, 1-29 INF, the unit

MAJ John E. Sarantakes, FA, has commanded the USAIS Demonstration and School Support Composite Battery. He is assigned as a project officer in the Unit Training Branch, Directorate of Doctrine and Training Development, USAIS, Fort Benning, GA.



is probably the only one in the US Army assigned to an infantry battalion. The 1-29 INF is, in reality, a combined arms mini-brigade, containing mechanized and straight leg infantry, airborne rangers, signal, engineers, the Army's only dog platoon and the field artillery. The battalion was organized to provide equipment and personnel required for the support of the Infantry School, thus freeing the 197th Infantry Brigade for conversion to a US Strategic Army Forces (STRAF) role. The battery, likewise, was designed to replace the 197th's direct support battalion, the 2d Battalion, 10th Field Artillery. For command and control purposes the battery became part of the 1-29 INF (Pioneers). Despite the friendly Redleg competition between the units, the 2-10 FA augments C Battery on certain problems requiring greater assets.

The mission of providing demonstrations and field artillery fire support for the Infantry School requires an unconventional mix of personnel and equipment. Since the battery's TDA was prepared by the Artillery Committee of the School, it insures necessary equipment and personnel are provided to support the POI.

Roughly two-thirds the size of a normal FA battalion in respect to the number of officers and weapons assigned, the battery is commanded by a major. Five captains and 16 lieutenants complete the staff. This is in contrast with a TOE battery composed of one captain and from three to five lieutenants. Captains function as the battery executive officer, the operations officer, the fire direction officer and heavy and light platoon leaders, while five lieutenants are slotted as gunnery officers, eight as platoon executive officers and assistant executive officers, two as assistant operations officers and a support section leader. The firing platoons, unlike the two-gun platoons in a conventional battery, are mini-batteries in many respects. The light platoon is structured with a headquarters element and six firing sections. A heavy platoon was organized out of battery resources in January 1974 and is composed of a headquarters element, three medium/heavy sections and a support section. The fire direction center is actually six FDCs in one, each separate yet under control of the FDO and the chief computer. Battery headquarters performs the normal administrative duties and includes an operations section, supply section and an attached mess section. A motor sergeant and communications sergeant are assigned, while mechanics are attached from the battalion maintenance section. Required communications support is also provided by the battalion.

The light platoon is equipped with six 105-mm howitzers M101A1, and seven 14.5-mm field artillery trainers M31. The heavy platoon has the bruisers of the battery: two 155-mm howitzers (SP) M109, two 8-inch howitzers

Company E (Composite), Field Artillery, in action during a ranger demonstration.

by MAJ John E. Sarantakes

(SP) M110 and two 175-mm guns (SP) M107. The support section, in addition to providing ammunition in the field, is also equipped with a 105-mm howitzer M101A1 and a 155-mm howitzer (T) M114A1, both of which are fired or displayed. The FDCs function independently out of six M109A3 shop vans and are serviced by two M18 computers, gun directional (FADAC). A conventional battery would have either four or six firing sections and one FDC.

The battery was tailored to support the two largest field artillery problems at Fort Benning. One firing problem is designed to teach rudimentary forward observation procedures to Pathfinder, Infantry Officer Basic Course and NCOES classes utilizing the M31, 14.5-mm trainer. A direct fire mission with a 105-mm howitzer is shown to emphasize the effect of HE-PD, HE-Time, WP and Beehive. A static display of all calibers of field artillery weapons and FADAC is also included.

The largest firing problem, and its variations, teaches the adjustment of field artillery to Ranger, Infantry Officer Basic Course, NCOES and, in the near future, Infantry Officer Advanced Course classes. This problem calls for thirteen 105-mm howitzers, and one of each caliber medium and heavy weapon firing from three firing points. A takeoff on the old Fort Sill fire power demonstration used on this problem is a demonstration of direct fire, using medium and heavy weapons. A high angle-low angle mission using a 105-mm howitzer, firing at the same target, is included to demonstrate the high angle capability and accuracy of field artillery. This demonstration phase is always very impressive and well received by students. The remainder of the problem calls for the students' adjustment of a platoon of two howitzers using different techniques. Also included is adjustment of close-in fire from bunkers utilizing observed and sound techniques. The bunker fire is adjusted to within 150 meters of the students. The 105-mm howitzers are employed in two-gun platoons, each with its own FDC, safety officer and XO, each firing for a separate group of students. Thus, six separate fire missions are conducted simultaneously. These firing problems require the utmost in planning and coordination between the battery, the 2-10 FA, which provides a six-gun firing battery, and with the instructors of the Artillery Committee.

In addition to the FA support missions and demonstrations, the battery also provides branch immaterial support and has its own training missions and RSOPs. Since January 1974, the battery has conducted both day and night RSOPs, direct fire competitions and OF training for the battery officers. This training has proven beneficial to officers and enlisted men alike, as it affords them the opportunity to do something different from the normal missions



The heavy platoon of Company E gets a round on the way.

as well as further their knowledge of field artillery tactics and techniques.

Although not equipped to do so, the battery set up, manned and operated a flash base central and flash OPs during a series of battery and battalion ATTs for the 2-10 FA in the winter of 1973-74. Some battery officers have gained experience and knowledge by working as assistants to primary staff officers in the battalion. And, on occasion they have substituted as infantry platoon leaders. All lieutenants regularly perform mortar safety duties as well as working as forward observers with IOBC classes during tactics problems in the field.

In October 1973, HQ, DA, changed the designation of the battery to Company E (Composite), Field Artillery, 1-29, INF, thus starting a controversy that is still raging. This change was ordered because the battery was a TDA unit and, therefore, was not authorized the lineage and honors of a TOE regiment. Not in many years has a field artillery battery been called a company. The Redlegs of the battery have not let it get them down. In the sports arena, they captured the 1973 battalion football championship; took second place in the School Brigade and third place in the post-level championship. In the 1974 softball league, they won the battalion championship, the School Brigade championship and went to the post finals. In another area, the unit dining facility was declared best in the brigade twice and best on post (for its size) twice again—all within four months.

The battery has come a long way since its total complement of one officer and five enlisted men stood on York Field for the activation ceremony. Today it numbers 154 officers and men. As of 30 June 1974, it had successfully completed 415 Infantry School requirements. Over 25,653 rounds of artillery ammunition and 11,940 rounds of 14.5-mm ammunition have been fired in support of training infantry students and battery personnel. Today, the battery stands ready to accept any challenge in providing the finest field artillery support possible for the Infantry School—proud to be a part of the small island of red in the vast sea of blue. ☒

In a foreign policy statement for the 1970s, a question was asked: "Beyond their value as a deterrent to war, how should our tactical nuclear weapons in Europe be used to counter specific Warsaw Pact military threats?" This question implies that prior to 1970, the United States did not have a clear in-depth policy on the employment of tactical nuclear weapons (TNW). Furthermore, a cursory inspection of currently published US Army doctrine reveals that this situation vis-a-vis tactical nuclear weapons also exists with regard to weapon deployment. In a report to the US Senate in 1971, Senator Gaylord Nelson indicated that we had over 7,000 TNWs located in Europe with probably several thousand more in the United States. He described these weapons as ranging in yield from tenths of a kiloton to hundreds of kilotons. The magnitude of these figures becomes significant

Beyond Deterrence

**a rational approach to the deployment of
tactical nuclear weapons in europe**

by
MAJ Ronan I. Ellis

when contrasted to our strategic stockpile of approximately 4,500 weapons. This TNW inventory represents a sizeable amount of firepower for which the United States has at best a minimal employment policy and a very general deployment doctrine.

The deterrent value of TNW in Europe is also subject to question since deterrence requires credibility and for TNW to be credible there must exist a complete policy concerning their utilization. If any credibility can be assigned to the deterrent value of TNW, it would be in preventing a surprise, preemptive nuclear strike since the high probability exists that such action would precipitate a massive TNW exchange and probably escalate rapidly to a strategic exchange. However, TNW are least credible in deterring a conventional attack and it is at this end of the conflict spectrum where the West is most vulnerable.

The conventional defense of Europe is generally agreed to be minimal at best. Brigadier General Toffler and Major Miller (1973) have described the threat in Europe in terms of divisions: where 31 Russians and 37 Warsaw Pact divisions face 24 NATO divisions of which 4½ are American. Additionally, it is estimated that the "other side" has 60 more divisions west of the Ural Mountains. Without

even assessing the relative strengths or states of readiness of these forces, the odds, at the outset, are overwhelmingly in favor of the East. The dilemma is that TNW policy is least clear and, therefore, less credible against the conventional threat—the threat to which the West is most vulnerable. The doctrine proposed here for the employment of nuclear-capable field artillery weapons in a European scenario will be applicable to a specific level or intensity of tactical nuclear war. Also considered are present-day constraints of manpower and money.

Background of TNW

TNW were initially deployed to Europe in the 1950s to overcome the conventional inferiority of NATO forces to the Warsaw Pact. It was during this time that the United States had an absolute strategic advantage in nuclear weapons and our foreign policy was based on massive retaliation. Under President Eisenhower almost the entire spectrum of war was viewed through a "nuclear window" and our Army was organized to fight such a war under the pentomic division concept.

This strategy, with its attendant tactical force deployment, can be credited with deterring nuclear war but it failed to stop or limit local crises as was evidenced in Korea, Suez, Cuba and Lebanon. This inability to react to nonnuclear conflicts, plus

Russia's increase in strategic nuclear capability in the early 1960s, led President Kennedy to espouse the strategy of "flexible" response. Under this concept, the Army was reorganized so that it could fight at all levels of the conflict spectrum. Prior to this the Army was capable of both nuclear and nonnuclear war; dual capability was now doctrine. However, conventional tactics were stressed and even exercised while tactical nuclear doctrine remained vague and undetermined.

The deterrent value of US strategic weapons during the 1950s and early 1960s made the requirement for TNW doctrine fairly moot. Since the advent of strategic parity, the so-called "balance of terror" achieved by the Russians in the late 1960s, the picture has changed. It is now generally held that this parity between Russia and the United States has for all purposes (except national survival) cancelled the possibility of a strategic exchange. Therefore, the deterrent value of strategic weapons to limit local wars which do not threaten the territory of the superpowers has all but vanished. This leaves our dual-capable tactical forces, conventional-nuclear, as the primary deterrent to war in Europe. The conventional forces have been assessed as insufficient and TNW doctrine as vague.

". . . for TNW to be credible there must exist a complete policy concerning their utilization."

Allied Preemptive Strike

There are several options and levels of TNW employment available to counter the Warsaw Pact threat.

The US or its allies could, in the face of imminent hostilities, initiate a preemptive TNW strike. Such a tactic, however, might be perceived at home and abroad as an American Pearl Harbor and could, therefore, be unacceptable to the American public. In addition, it might not be possible to determine just when such an attack from the East would occur. Western intelligence was unable to predict the 1973 Middle East War and in Europe itself, the Allies were surprised by the 1968 Russian "invasion" of Czechoslovakia. Even though a surprise armored attack by the Warsaw Pact into West Germany could conceivably advance more than a 100 kilometers in the first day (Karber, 1970), a tactic dependent on recognition of an imminent large scale attack is militarily unsound. Therefore, for both military and political reasons, a preemptive strike by the US is not a feasible TNW option.

Russian First Strike

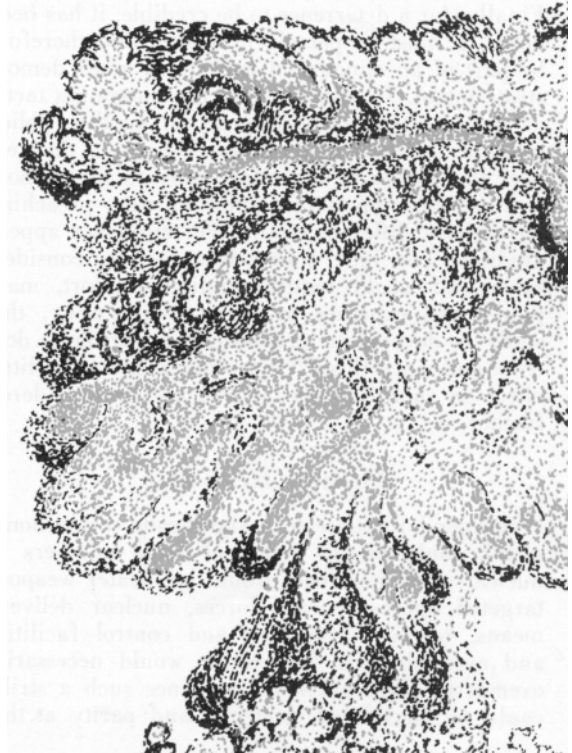
A second option would be our use of TNW in response to a Russian preemptive nuclear strike. A Russian nuclear first strike would precipitate a response, at least in kind, if not greater, by the West. Therefore, the Russian strike would probably target all nuclear-delivery means within the European theater (capable of inflicting a second strike) on Russia or her Warsaw Pact forces. This would necessitate a massive attack by the Russians which would surely couple rather than decouple our strategic weapons if for no other reason than because our theater weapons would have been neutralized. Geneste (1972) felt that if Russia fired nuclear weapons into West Germany, the US could not decouple its strategic weapons from the theater since, under a Russian first strike hypothesis, we would have no option but to return in kind, at a minimum. This is one reason for having TNW in Europe—a deterrent to tactical nuclear war as escalation in the situation described would become exponential. Therefore, Russian first use of nuclear weapons becomes improbable and, while we should continue to deploy TNW against such an eventuality, our response is fixed and our policy firm and credible. The only severe flaw in this rationale is the possibility that West Germany might not be willing to suffer a massive nuclear exchange on her homeland.

Conventional Attack

Our options in response to a Warsaw Pact conventional strike into Western Europe provide the crux of the problem. This is the Russians' best "suit" since they have conventional superiority and might view strategic parity and our vague tactical nuclear employment policy as prohibiting us from effecting a timely nuclear response.

Under the Russian conventional strike scenario, the West has two response options: nuclear or conventional. The conventional option will be considered first. In reality, an initial conventional response is almost mandatory to preclude, for example, a misplaced East German patrol precipitating a nuclear exchange. Additionally, a NATO conventional defense against a large-scale push from the East might not be as weak as the statistics tend to imply. In World War II stubborn German defenses required ratios of 5-to-1 US and 7-to-1 Russian attackers to advance, albeit slowly, against German positions (Heilbrunn, 1965). The tactical advantage in conventional warfare is with the defense. This advantage is dependent on several factors—terrain, morale (protecting the homeland) and firepower. In World War I the machinegun and artillery barrage stopped the cavalry charge making firepower dominant and defense the favored tactic. World War II armored forces gave mobility back to the attacker and the defense assumed a less favored status. However, the recent successes of infantry antitank weapons and air defense missiles in the 1973 Mideast War have returned much of the tactical advantage to the defense again. While nuclear weapons add another dimension to the battlefield, at this point only conventional engagements are being considered. It is therefore a viable tactic to meet a conventional attack with a conventional response—to insure it is in fact a premediated, significant action—and to defeat it without resorting to nuclear weapons if possible.

It is significant to note that a requirement for maintaining dual capable forces has been established:



"... Russian first use of nuclear weapons becomes improbable...."

nuclear forces to deter a nuclear exchange and conventional forces to defend against a conventional attack. However, if the conventional attack is of such magnitude or our defensive posture so weak that the attack cannot be stopped, then nuclear weapons must be considered. The question now is what TNW options are available and feasible as nuclear responses to a significant conventional attack?

Demonstration

While there are many options and numerous perturbations of these options available, this article will address only three TNW responses to a conventional attack. After a conventional defense has determined that a major attack has begun and the defense can no longer repel such an attack, a nuclear weapon could be detonated as a show of force, a demonstration (Harrison, 1972). The detonation could be an atomic demolition, air defense or even a battlefield delivered nuclear weapon. The firing would demonstrate resolve to the enemy that we will employ tactical nuclear weapons. The desired result would be that the enemy, realizing we were serious in our use of nuclear weapons, would opt to negotiate, disengage his forces and return to the status quo. The risk in this tactic is that, realizing our intent, the enemy would preempt our threatened strike, destroy our massed and vulnerable forces, then continue his attack. This risk is significant and we would have used our first nuclear shot to announce our intention to use a capability the enemy already knew we had. Critics argue that by not attacking the enemy with our "ace in the hole" we lose the initiative without any gain or advantage in return. Finally, for a deterrence to be credible, it has been noted, it must be perceived as such and therefore be part of an announced policy—we must demonstrate intent. To announce the demonstration tactic as policy negates its purpose, so another policy must be declared in its place. We would then expect the enemy to react favorably to the demonstration while up to that point we were preaching an entirely different tactic. We might not appear credible. The idea nonetheless deserves consideration and would require minimum effort, manpower and expenses to execute. However, this study is devoted to proposing field artillery doctrine and since this TNW option would have little effect on such doctrine, it will not be considered further.

Theater Response

A second response to a significant conventional attack could be the firing of large numbers of nuclear weapons. These would be theater weapons targeted against enemy forces, nuclear delivery means, reserves, command and control facilities and even airfields. The strike would necessarily exempt the Russian homeland since such a strike could be considered strategic, and parity at this level has all but cancelled the possibility of strategic exchanges. The major advantage of the theater-level strike is that it gives the West an upper

hand immediately by stopping and destroying the enemy. However, in doing this we might limit the enemy's options and therefore his willingness to negotiate. After the theater-level strike, the enemy might be so decimated (or perceive himself to be at such a disadvantage) that his only recourse would be a strike at the strategic level. This could be a deterrent to a conventional attack which would make this tactic credible; however, if the aggressor feels weakened and threatened by the nuclear exchange, he might strike out irrationally. Additionally, any enemy theater-level weapons remaining would surely be fired in a second-strike role against Western Europe. The theater-level response is probably the response perceived by the Warsaw Pact today based on our capabilities. However, this tactic may not be acceptable to our Allies because their population centers and homelands would be risked by the enemy's second strike. To be acceptable, our first use must be early in the conflict to preclude collateral damage from our own weapons in Western Europe. This is true for all TNW options to a conventional attack. If the release of TNW is delayed too long, the enemy might be so deep into the West that it would be politically impossible to fire. If Russia were to break through and seize a large metropolitan city (i.e., Nuremberg or Frankfurt), it is doubtful we would fire nuclear weapons to dislodge her. We would then be presented with a *fait accompli* (Heilbrunn, 1965).

While success under this option could be complete, the risks of escalation and probability of unacceptable damage to our Western European Allies make the theater-level response option almost unfeasible. Our capability to employ a theater-level response exists and the East must consider it, but it remains more a deterrent to a nuclear strike than a response to a conventional attack.

Limited Response

The final TNW response to be considered is an intermediate option—a limited TNW strike. A strategic strike is one aimed at the homeland or perceived to threaten the survival of a superpower. A tactical strike is more than simply the opposite of a strategic strike. A tactical strike on the homelands of the European nations is viewed by the nations concerned as a strategic strike. A tactical strike which inhibits a nation's ability to defend itself (i.e., East European airfields to the Russian air defense) is also very close to the strategic target definition. A tactical strike is not interpreted by the intent of the sender but by the perception of the receiver. It is the receiver who decides the level of response and, thus, the degree of escalation. A limited TNW strike must be perceived as such, minimizing the possibility of escalation. This option must also accomplish the immediate goal of

stopping the conventional attack. The strike should therefore be aimed at leading elements and immediate reserves of the advancing army. Major command and control elements, as well as deeper reserves and even general support nuclear capable delivery means, would be avoided if possible. The enemy must be stopped and simultaneously must perceive the nuclear strike as limited, with escalation probable only if he does not terminate the attack. The enemy's ability to communicate and operate should not be placed in an untenable position giving unacceptable advantages to the West. Since this limited-use option has both political and military goals, it is restrained in execution. If employed early in the conflict, once it is determined that the conventional defense cannot deter the attack, this option would minimize collateral damage.

Two additional advantages of the limited TNW option are that if it is perceived as limited, it reduces chances of escalation and accomplishes much of the military mission—stopping the attack. Negotiations could ensue then with a return-to-normality goal. The major disadvantage is that the tactic does not defeat the enemy. This leaves the Warsaw Pact with more than enough forces to continue the attack—this time using nuclear weapons! Such a response by the East would be highly escalatory and the basic assumption throughout this argument is that a strategic exchange serves the interests of no one. In addition, the limited TNW option does not necessarily restore the borders to pre-attack configurations, but does require negotiation.

Since there is no best TNW response to a conventional attack, a tactic similar to the limited-response option should be considered for adoption since it satisfies the immediate military requirement, minimizes escalation and is credible.

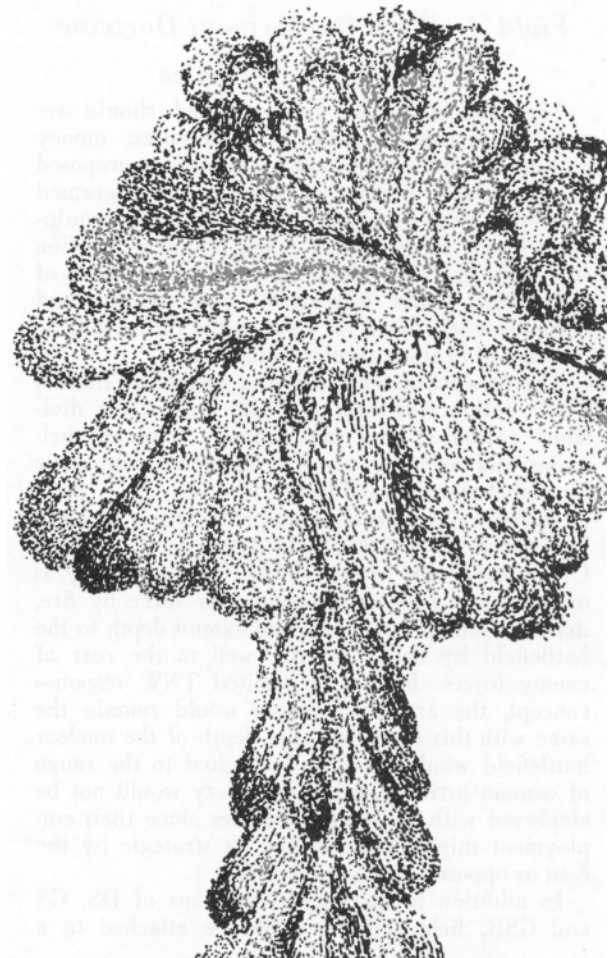
Adoption of the limited-response option to a conventional Warsaw Pact attack would close the credibility door on our use of TNW and answer the question at the beginning of this article. Adoption of this tactic as policy would allow the Army to establish doctrine for the deployment of forces against a conventional/nuclear threat and prepare meaningfully for TNW use.

The option requires dual-capable forces to fight a conventional battle first, then, as a minimum, fire a nuclear exchange and prepare for continued nuclear war. Heilbrunn (1965) asserts there is no defensive deployment scheme which completely satisfies the requirements of both nuclear and conventional war. It is considered almost impossible for a large army (i.e., Land Forces Central Europe) to switch from conventional tactics to complete nuclear deployment after the battle has begun. Chaos would ensue if not among combat forces, then certainly among combat service support forces. Also, the signature of converting from one posture to the other would negate any initiative the West would have and tempt the East to preempt our planned limited strike. Therefore, the deployment doctrine developed must be structured to fight both conventional

and nuclear battles with minimum disadvantage.

The use of TNW must be planned early in the battle to insure delivery only near the borders, minimizing collateral damage. To combine a conventional defense, surprise and early TNW use into a policy, the author believes some presidential prerelease procedure must be assumed. Control of the nuclear trigger could be maintained by specified conditions. Examples are the loss of territory or an untenable military situation with the progressive release of weapons and delegation of authority to fire keyed to the situation. This would be done in consonance with the European nations concerned. The theater commander would communicate to the President, "Condition X," and if no reply were made, approval would be assumed for the weapons specified in plan "X." The strategic trigger would still be the President's, but tactical release would be based on the theater commander's decision within certain political constraints (Geneste, 1971).

The deployment of forces under this option would be keyed to the two major phases of the envisioned conflict: nuclear and conventional. Forward defensive forces would deploy primarily for a conventional battle while the major reserve and



combat service support forces would be prepared for a nuclear environment. The forward forces would attempt to conventionally defeat and repulse the attack and, if unsuccessful, fire TNW in an effort to halt the advance and end the altercation. The battle would be brief, three to four days at the most, before the situation would stabilize or escalate. Therefore, major reserves and combat service support units would not be required for the immediate battle and could deploy in a nuclear scared posture.

The delivery systems used to fire the limited TNW response must follow the guidelines of this option. They must be perceived as tactical weapons without any strategic implications. This is true also for the presidential prerelease assumption. Field artillery cannons are weapons ideally suited for this role from the standpoint of range, yield and enemy perception. Due to the limited range of these weapons, the limited TNW strike force would have to be part of the forward defensive forces.

The tactic developed so far has been established through an examination of national strategic requirements, political realities, military tactics and weapon capabilities. What remains to be determined is a doctrine for the deployment of the nuclear capable artillery assigned to the forward defensive forces.

Field Artillery Deployment Doctrine

Field Artillery Tactics

The doctrine to be recommended should require minimum increases in manpower, money and equipment. Furthermore, while most proposed programs rely heavily on equipment programed five years or more hence, and in some cases equipment barely developed, it is felt that new doctrine should be tactically sound first. Considerations of technology would follow. No new or proposed equipment scheduled for issue in the future will be considered in these recommendations.

The forward defensive forces under the limited TNW option will most probably consist of: divisions (armored and mechanized), separate brigades and armored cavalry regiments with their normal supporting artillery.

Current Army doctrine on artillery use is found in Field Manual 6-20, Field Artillery Tactics and Operations (US Army, 1973). Field artillery is organized to support the maneuver force by fire, deliver counterbattery fire and extend depth to the battlefield by delivering fire well to the rear of enemy forces. Under the limited TNW response concept, the artillery mission would remain the same with this exception: the depth of the nuclear battlefield would be initially limited to the range of cannon artillery. Missile artillery would not be employed with the forward forces since their employment might be construed as strategic by the East as opposed to a limited strike.

In addition to the normal missions of DS, GS and GSR, field artillery could be attached to a supported unit, placing the artillery under the direct command of the maneuver

unit. Additionally, the author submits that artillery units could be placed under the operational control of a maneuver unit leaving administrative and logistics the responsibility of the artillery organization while tactical operations become the purview of the maneuver force commander. These missions and the rationale for their assignment remain essentially valid when considering the limited TNW response option.

What little doctrine exists for nuclear operations in the Army is contained in FM 100-30 (Test) Tactical Nuclear Operations (US Army, 1971). While the manual is vague in its guidelines and several of its tenets clearly do not apply to the limited-use situation depicted here, some of the assessments of nuclear battle are valid. The effects of nuclear weapons will cause units on the battlefield to be widely dispersed, straining command and control, and requiring increased redundancy in such facilities. The manual advises separation of company size units by approximately three kilometers. This produces a division defensive front of about 40 kilometers which is unacceptable for the forward defensive forces described here whose first mission is to defeat the enemy conventionally. Dispersion of defensive forces must still be considered but the amount of forces assigned the forward defense mission and terrain to be defended should be the major considerations in the location and size of unit positions. Dispersion may be achieved by assigning a division a zone in excess of its normal conventional capability.

Field artillery deployment in support of the limited TNW option should be dispersed consistent with its tactical missions and zone of the supported force. Three possible deployment concepts will be considered: split battery, dedicated battery and silent gun.

Split Battery

The tactic recommended by FM 100-30 for artillery deployment in a nuclear environment is the split-battery concept. The battery is split in two firing positions dispersed so the entire battery will not be destroyed by a single nuclear weapon. The three-kilometer distance is recommended for the separation between platoons. Radio is the primary means of communications and any additional security required for the separate platoon locations would be supplied by the maneuver commander. The platoons would fire both conventional and nuclear missions. While this deployment increases the survivability of the artillery, it degrades conventional support and makes centralized control difficult. Command and control, already taxed in a nuclear possible environment, is made doubly difficult by splitting the battery. Personal experience with split batteries in Vietnam has shown that such operations require, as a minimum, additional manpower and communications, survey, fire control

and fire direction equipment. The requirements for all platoons to fire nuclear weapons place additional demands on weapon security forces and fire direction personnel. In all fairness to the developers of FM 100-30, it should be noted that this deployment scheme was proposed for a nuclear environment preceded by a transitional phase from conventional fighting—a step this author has found unacceptable. The manual also places no constraints on manpower or equipment requirements. The tactic is flexible, however, in that the commander has nuclear capable artillery ready to fire throughout his zone and the loss of one or two elements would not seriously jeopardize his nuclear fire support.

A variant of the split-battery concept is the shoot-and-scoot tactic. This variant applies equally to the other concepts in that it combines the aspect of mobility to the characteristic being discussed, in this case dispersion.

Once the artillery unit fires a nuclear round it rapidly disperses to a new position for self-protection. Depending on the number of nuclear rounds fired, the number of units firing and the size of the zone, the battlefield could become a very busy place for the artillery. The constant mobility of the shoot-and-scoot tactic gives the defense no advantages over the offense since once the defender moves, he is as exposed as the attacker. Some movement is necessary, but to move each time a nuclear round is fired appears excessive and would become an identifying signature of a nuclear capable unit. Restricting movement to night and periods of limited visibility reduces detection and still allows for mobility on the battlefield. Also, artillery sections could move to predesignated positions where targets and firing data have been preplanned, thus reducing the communication requirement.

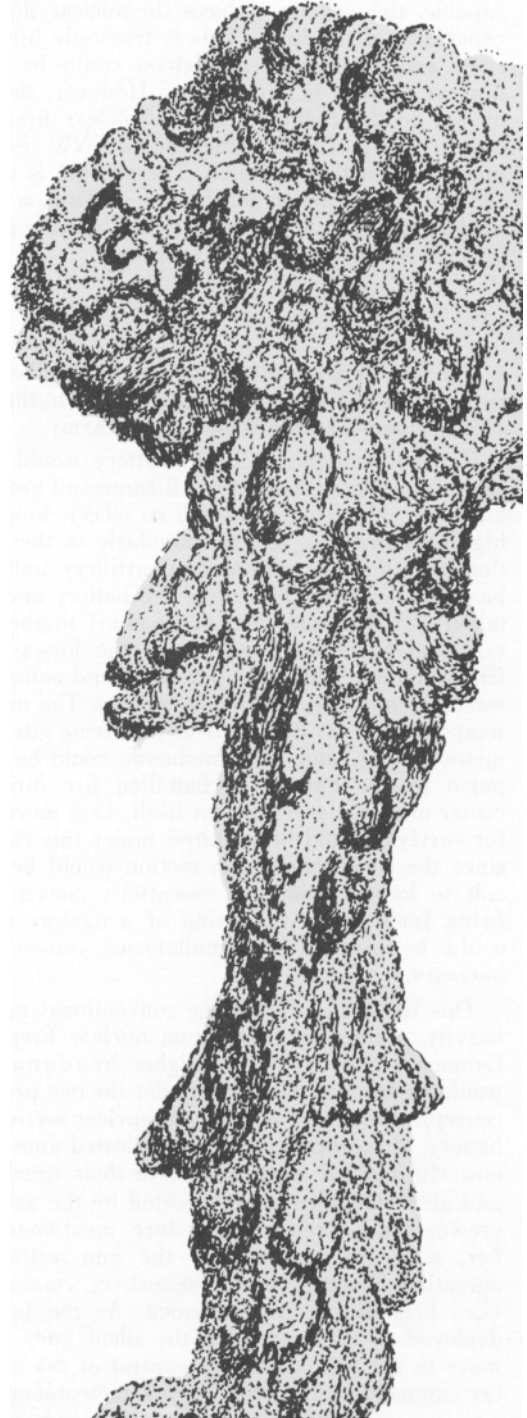
Dedicated Battery

A second deployment tactic would be to have one nuclear dedicated battery per battalion. The nuclear battery could be employed by platoon or as a whole battery. This is similar to the approach taken by the British Army for deployment of its nuclear artillery. Direct support battalions would provide nuclear fires to committed maneuver brigades and supporting artillery units would be responsive to the whole force in the general support or general support reinforcing roles.

An advantage to this method is that it limits command and control of nuclear fires to one battery. Weapon security personnel and additional equipment for both nuclear and split battery operations are greatly reduced but conventional firepower is lessened. Not only are security and fire direction requirements reduced under the dedicated battery concept, but communications (an essential element to any use of nuclear weapons) are simplified.

Communications, from target acquisition to the transmission of fire commands to the fire unit, are sensitive

to interruption by both enemy jamming or nuclear weapon effects. In a nuclear environment, the less dependent a tactic is on radio communications, the more acceptable the tactic becomes. Even computers which generate fire commands are subject to failure from the electromagnetic pulse of a nearby nuclear detonation. Wire, as opposed to radio, has been suggested as the primary source of communications for a nuclear battlefield



due to its hardness to the electromagnetic pulse and other effects of nuclear weapons. Messengers, vehicular or airborne, should also be included in communication planning for nuclear deployment.

A criticism of the dedicated battery concept is the vulnerability of the nuclear weapons, located with the battery. This could be avoided by delivering the weapons on a mission-by-mission basis, either by truck or helicopter. Finally, since all artillery weapons located in the division are nuclear capable, this scheme reduces the nuclear delivery capability of the force. This is true only initially, since another battery or platoon could be made nuclear capable in short order. However, the real answer to the reduction of the nuclear firepower question is the fact that the limited TNW response option is just that—limited. The mission is to initially stop the enemy, not destroy it. Thus, a lower nuclear profile would support the limited nuclear goals of the forward defensive forces.

Silent Gun

The last deployment technique to be discussed is the silent gun concept. This is similar to the procedure planned by the West German Army.

Under this procedure each battery would dedicate a gun section with a small command group to a nuclear role. The crew, with an officer, would be highly-trained and selected similarly to the selection procedure in conventional artillery units for base piece crews. The rest of the battery and battalion would devote their main effort to the conventional fire role in support of the forward defensive forces. Additional personnel and equipment would be minimal under this concept. The nuclear weapon could be delivered to the firing site on a mission basis, and fire commands could be computed by the battery or battalion fire direction center or at the gun position itself. Less movement for survival would be required under this concept since the single silent gun section would be difficult to locate among an essentially conventional firing force. Also, the firing of a nuclear round could be masked by simultaneous conventional barrages.

This technique weighs the conventional mission heavily, maintaining minimum nuclear firepower. Command and control by higher headquarters would be less complex than under the two previous concepts since there is only one nuclear section per battery. However, the nuclear dedicated guns are a powerful combat force and since their timely use and absolute control is predicated by the assumed presidential prerelease procedure mentioned earlier, a tactical mission for the gun sections of operational control to the maneuver commander (i.e., brigade) is recommended. As the force is deployed to alert positions, the silent guns would move to the field under the control of the maneuver commander. Logistics, survey, meteorology and fire commands would still be provided by the artillery

command, but positioning, targeting and firing would be accomplished through maneuver command channels. While this keeps maximum control over nuclear fires, it complicates the computation of fire commands. However, it is not too difficult for the battery/battalion to determine fire commands, using a FADAC, for three separate guns while continuing their normal direct support mission. For emergencies, the silent gun section would have a manual computation capability.

The silent guns would move to prepared positions where the emphasis would be more on shielding of the gun section than dispersion.

Armbruster and Singer (1965) recommend increased shielding from nuclear effects through the construction of section bunkers. While at first such gun positions appear to be death traps, the survivability of dug-in troop positions to fire power has to be relearned in every war. A relatively inexpensive bunker or firing position would protect personnel from up to a 100-kiloton burst within 600 meters. Several such secluded positions (to include dummy positions) could be constructed and dispersed in depth throughout the zone of the forward defensive forces. Wire or cable would be installed and dug into selected positions providing relatively secure and reliable communications. Supplies, fire control equipment and possibly nuclear weapons could be stored at a few of these sites. Some positions could be manned on a permanent basis with rotating crews, or the guns could be deployed to the bunkers only on alert. Survey of both position and target area could be accomplished in advance, and calibration and met plus VE techniques could satisfy artillery registration requirements.

The semi-hardened sites would provide, to a limited degree, the kind of protection our strategic weapons enjoy, thereby increasing the deterrence value of TNW.

The most notable disadvantage of the single-gun concept is its minimal initial nuclear capability. While all the concepts discussed possess advantages and disadvantages, it is felt that the single-gun concept optimizes artillery deployment for the limited TNW response option. The silent gun, hardened-site deployment, displays a limited initial nuclear threat to the enemy but, nonetheless, demonstrates a nuclear resolve which is both readily available and survivable. As for the intensity of a limited TNW conflict, if only a three-day nuclear battle is considered with no corps artillery reinforcing the division; an allocation of only three rounds per battery per day equates to an expenditure of 102 nuclear weapons per division. By any definition, such firepower can hardly be considered conventional and yet this is a restrained battlefield.

It is envisioned that this level of conflict should be sufficient to stop a conventional assault and cause the enemy to review the bidding.

Summary

In quest for an answer concerning the use of tactical nuclear weapons in Europe, it has been determined that TNW can be a deterrent to both tactical nuclear and major conventional war. For TNW to deter, policy must be formulated at the national level on their use, and this policy should then be converted to military doctrine concerning TNW deployment. While theater-level weapons seem to deter theater exchanges, preemptive or otherwise, a limited employment of field artillery delivered nuclear weapons might also deter major conventional engagements. A limited TNW response (one which would target only the leading elements and reserves of an advancing aggressor early in the conflict near the border in an effort to blunt and halt the attack) appears to be the most effective nonescalating tactic. The enemy would not be destroyed entirely and some of his maneuver and communication capability would be left essentially intact. Having demonstrated our nuclear determination, negotiations should then ensue; otherwise larger reserves, both nuclear and conventional, would be brought into play in an escalating war. The results would be unacceptable for both sides.

Army forces would be deployed for this limited nuclear battle with a forward defense force displaced near—conventionally, and major reserve forces well to the rear, in a nuclear dispersed posture.

(continued on page 64)

The 1973 Neareast War



This article is the first of three parts which were printed in the professional military magazine **Truppenpraxis**, Volume 2, 1974, published by the German Armed Forces. Although one year has passed since the Yom Kippur War, we believe that this is one of the most comprehensive overviews of the war available. The author, Horst Toepfer, is a Colonel of the General Staff. The second and third parts are scheduled for publication in subsequent issues of the **Journal**. Lieutenant Colonel Porter is the Officer Student Battalion commander, Field Artillery School Brigade, USAFAS, and Lieutenant Colonel Dobbert is the German Army liaison officer to USAFAS. —Ed.

*The author, who is known to the readers of **Truppenpraxis** through his earlier contributions concerning "Triphibische Kampfführung" (TRICAP concepts), has evaluated all the available sources about the 1973 Neareast War in order to draw the first lessons from what occurred. In the first part of his presentation, which appears in this issue, the author describes the war preparations and the beginning of the war from the first battles until the cessation of offensive operations. In later issues in Parts II and III, counterattacks from the defense, the effectiveness of new weapons, resupply of weapons and logistics will be analyzed in general. In addition, the author will express his views concerning the problem of strong bargaining positions and military armament as means of détente.—Ed. **Truppenpraxis**.*

by
COL Horst Toepfer
General Staff
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translated
by
LTC Jon Porter
and
LTC Gerhard Dobbert

With the end of the 1973 Neareast War and even during the first weeks of the war, there appeared not only comparisons with the 1967 Six Day War but also questions which produce lessons from the events occurred before, during and at the end of the war.

The more precise military and political comparisons with the Six Day War can only be examined later, historically. But it is already an established fact that both wars differ fundamentally from each other. While the Six Day War was a blitzkrieg in which the defense had practically no consequence, the 1973 War was, with regard to armament and fighting spirit, above all a balanced armed conflict in which finally the art of military leadership, both operational and tactical, was decisive. The first lessons from the 1973 War, especially when viewed militarily, can be drawn for the defense in general, but particularly for the defense of the NATO territory. Naturally, in doing so, certain events, above all, political events, must be viewed somewhat differently because one super power in NATO faces another superpower with her satellites. Supporting or limiting a war involving these superpower blocs, as was done in the Neareast War, could not be achieved with similar success either by China or by the neutral countries of the world.

"It is still not clear whether the Arab operational objectives were the destruction of Israel or merely to win back . . . territories."

The following observations from which lessons should be drawn are arranged primarily according to the chronology of the conflict. The final observations are based on the occurrences of the war seen as a whole. All the observations can be compiled in three parts: Prologue and the Beginning of the War with Attack and the Necessary Defense; Counterattacks and Offensive Operations from the Defense; and Effectiveness of New Weapons, Replacement of Weapons and Supply, Value of Strong Bargaining Positions and Military Armament as a Means of Détente.

PROLOGUE AND BEGINNING

Intelligence as a Tool for Military and Political Leadership

Israel has always conducted a comprehensive program of military intelligence and has always had a good and clear picture of the military posture of her potential enemies. At the same time she has had an equally good picture of the political situation. This awareness always produced the correct military-political considerations and consciously strong support of the [Israeli] Armed Forces as a factor of power for a government in a society which

was constantly filled with tension and the possibility of military conflicts with Arab neighbors.

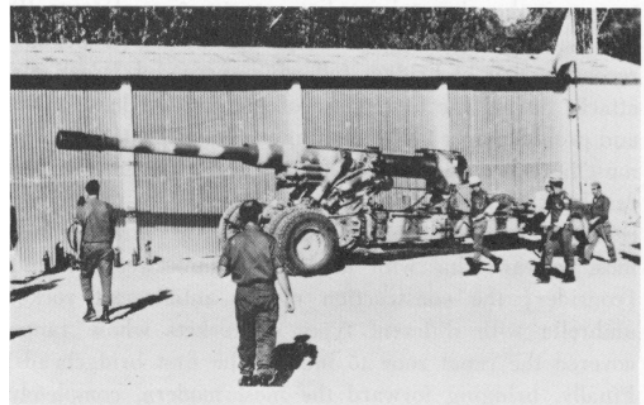
The increased massing of Arab troops, which had already been recognized during the summer, could at first be concluded to be reinforcement of Egyptian and Syrian defense. The quality of the intelligence was demonstrated by the early certainty that this concentration would, however, lead to an attack and that this concentration [massing] of troops was completed on 4 October 1973. It was also understood that Lebanon and Jordan would most probably not undertake any immediate military efforts.

On the other hand, how difficult it is to perceive the actual time of attack was demonstrated by the subsequently successful Arab surprise attack. Likewise, it proved to be very difficult to predict correctly the effectiveness of new weapons and weapons systems although the variety and technology (as well as the fielding or delivery) of these weapons were known. This last problem will have to be considered in particular detail.

Lessons:

- a) Continuous and exhaustive intelligence of a military and political nature is indispensable.
- b) The complete military situation of a potential enemy must always be available; enemy actions must be correctly interpreted; and false perceptions can lead to false military and political decisions.
- c) The real military situation must be available to the politicians who must also have an equally clear picture of the political situation.
- d) In times of tension, such as still exist in Europe, the armed forces are ultimately the government's deciding power factor for successfully achieving national objectives.
- e) For that reason it is necessary for the government to provide clear and convincing support of the armed forces.
- f) Early recognition of attack preparations is possible,

Captured Soviet 180-mm gun-howitzer (M1955).





MiG breaking over a gun emplacement.

however, recognizing the completion of these preparations is what is decisive.

g) Nonetheless, early knowledge of the actual time of attack becomes the important factor in order not to lose the initiative early through surprise enemy attack.

h) In a partnership, all results of intelligence, which are nationally recognized, must be available to all partners.

Surprise Attack—Fighting Spirit

In spite of the just mentioned good intelligence of the Israelis, the actual attack by the united Egyptians and Syrians must be evaluated as a successful surprise attack. The start of the war can be labeled as a "Surprise Attack after Deployment." In no case was it an "Attack from Forward Positions." It was too well prepared for that. This was demonstrated by the prepositioning (by the Arabs) of sufficient crossing means along the Suez Canal to permit the almost immediate construction of from 10 to 12 war bridges. It is also proved by the immediate reconstruction of bridges following successful Israeli air attacks during the first phase of the war. At least 1,500 and probably over 2,000 running meters of floating bridge must have been available and well camouflaged near the canal. In addition to that, one must consider the deeply echeloned concentrations of crossing troops armed in the most forward line with modern antitank weapons and [consider] the construction of an antiaircraft rocket umbrella with different types of rockets whose range covered the canal zone to include the first bridgeheads. Finally, bringing forward the most modern, completely mobile antiaircraft

rockets of the Soviet type SAM 6 directly onto the canal showed the good planning for the attack.

Also the attack in the Golan Heights was a "surprise attack after deployment." Here the proof is to be seen in the conduct of the first successful attacks which were fed [reinforced] immediately by deeply echeloned reserves in spite of the difficult terrain. In addition, units from other friendly Arab countries were committed from the beginning on. The most modern Soviet tanks made it possible [for the Arabs] to penetrate the Israeli defensive positions and finally occupy the Golan Heights. Here, modern antitank weapons were also carried along in the most forward line and the air space was shielded by antiaircraft rocket systems. Three important factors were to be noted on the West Front [Suez Canal/Sinai] as well as on the North Front [Golan Heights] which influenced the degree of surprise and the initial Arab successes on both fronts simultaneously:

- The well-planned coordination of the Egyptian and Syrian armed forces led by one joint headquarters.
- The excellent training of the attacking units [in the use of] the most modern war material and the unexpected fighting spirit of the Arab troops which had been achieved in six years of ideological schooling and military/technical training.
- Although the Israeli armed forces had the expected [degree of] fighting spirit and good but not always the most modern armament, they had to leave the initiative completely to the enemy in the first two days of the war. This indicated a certain carelessness and overconfidence as can be seen further in the relatively weak manning of the border positions and [the lack of] significant, immediately available reserves.

Lessons:

- a) A successful surprise attack without preparations, that is to say, an attack from prepared positions, is not possible if sufficient border troops are available to the defender.
- b) Without the presence of sufficient border troops which are always immediately available, an attack from prepared positions promises complete success if it achieves complete surprise.
- c) Prepared and occupied border positions, especially behind natural barriers, still offer the best protection and force the enemy to assemble [mass] and prepare. These preparations can be recognized for what they are.
- d) Unity of command and coordinated actions are required even of a strong attacker.
- e) The most modern armament and at least temporary control of air space, above all through [the employment of] air defense rockets, are equally necessary for attackers

and defenders in order to be able either to attack or conduct a mobile defense successfully.

f) The fighting spirit of the troops is decisive but it is also subjected to changes which must be recognized and respected.

g) Each surprise attack gives the enemy the initiative and with it the first chances for success.

h) Incorrect estimates, carelessness or overconfidence, as well as positions which are too weakly manned, bring the attacking enemy advantages which will be difficult for the defender to make good again and which cost the defender high losses in men and material.

Attacker's Polemics to Justify the Attack

Considering these observations and in order to understand better the later strategic and tactical events, this question appears to be important: "Who was really the attacker?" The 1967 Six Day War was initiated by the Israelis with a spoiling attack which created the prerequisites for the successful blitzkrieg. Since the beginning of time, however, preventive wars have carried with them the blemish "aggressor." World opinion at the time was split, although the Israelis, in order not to be overrun, simply had to forestall the Arab armed forces which were prepared to attack. Thereby, the Israelis were able to create a perimeter for a better and mobile defense. The beginning of this [1973] war showed the accuracy of this consideration. In this war, Israel purposely forewent the first blow, although the forthcoming attack was recognized and the situation was similar to that of 1967, because she [Israel] relied this time on the occupied buffer zones and did not want to offend world opinion once again.

". . . the Arabs did not consider themselves to be aggressors."

The initial attack this time was conducted by the united Egyptian-Syrian armies. It is still not clear whether the Arab operational objectives were the destruction of Israel or merely to win back occupied Arab territories. After the beginning of hostilities, the latter was maintained by the Arabs to be their objective. If this were correct, then Jordan would have had to join in to win back her territories. Whatever the case, the Arabs did not consider themselves to be aggressors. They maintained that no one can be an aggressor who simply wants to win back his "stolen" territory! One Arab journalist expressed it thusly: "It cannot be forbidden to anyone to stretch out his feet under the table in his own house!" The Soviet Union supported these views and labelled the Israelis as aggressors. These reflections are based on the teachings of Lenin which classify as "justifiable wars" wars of

socialist countries which have as their goals to ward off an invasion by imperialist countries or national wars for freedom from foreign oppression as well as to defend against attempts to enslave [the people]. Therefore, [who really attacks] is thus uninteresting to a politician who thinks as Lenin did. If it is a bourgeois or capitalist country, the war is unjustified; if it is a socialist country's war, this country acts justly even if it is the attacker. Therefore, Israel will always be stamped as the aggressor.

Through these polemic considerations it was and is possible to influence the people and to win the masses. This was recognizable on the Arab side from the beginning of the war on and it radiated to the countries counted among the socialist bloc and to neutral countries tending to lean in their direction.

Lessons:

a) As viewed from the East Bloc, each imperialist war is unjust; each war waged by a socialist country is just.

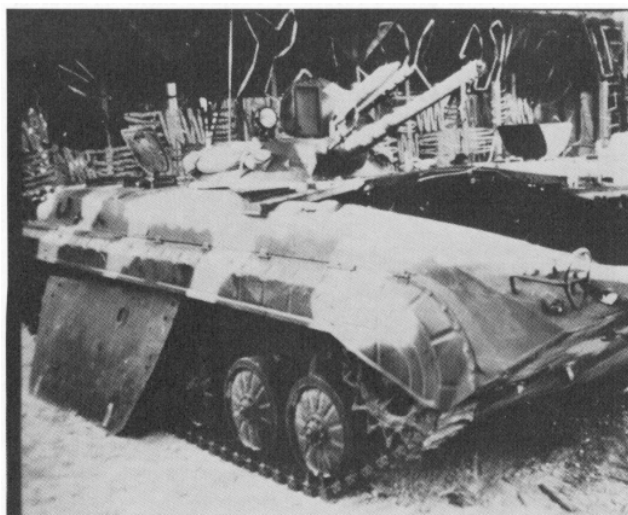
b) Such theses—based on Lenin's theories—can stamp as aggressor even a defender such as NATO if it were attacked by a single socialist country or even by the entire East Bloc.

c) In such a way not only world opinion, but even friendly and allied countries' opinions, especially [those of] their people, and even perhaps [of] our own population, can fall into doubt if precautions are not taken early. . . .

Choosing the Time of Attack

According to the earlier statements the attack by the united Egyptian and Syrian armies was recognized in

Soviet Armored Amphibious Combat Vehicle (AACV) armed with a sagger and a 73-mm smooth bore rifle.



time because of the preparations required. Only the exact point in time for the attack to begin was not known. According to the situation, it must be supposed that Israel had with certainty recognized the end of the attack preparations on Friday, 5 October 1973, but did not believe the attack would take place in the middle of the high Jewish holiday, Yom Kippur. Perhaps [it was] a religious mistake, an overestimation of the respect the Arabs have for the holiday, or perhaps the desire of the Israeli government not to disturb the population's celebration of the holiday or also possibly its desire not to escalate the critical situation through a partial mobilization. Whatever might have prevailed upon Israel not to reinforce her defenses early is unimportant for these considerations here.

Lessons:

- a) An enemy intending to attack will attack at any time in order to insure for himself the element of surprise.
- b) Such an enemy respects neither Sundays nor holidays. On the contrary, he considers these days in his calculations.
- c) Moreover, the time of day plays no important role. With the modern equipment available these days, an attack can come at any time.
- d) If battle preparations are recognized or suspected, then the primary objective must be the reinforcement of your own defenses even if your own population becomes uneasy or if the reinforcement measures for the defense have an escalating effect.
- e) Discretion in this sense is a calculated risk and is not respected by a determined enemy.

Mobilization—Key to the Defense

When the surprise attack of the united Egyptian-Syrian armies began on 6 October 1973, Israel had available only her normal armed forces of 115,000 men. Of course, a well-planned mobilization system was available but the

Destroyed Soviet T-62 tank.



time for mobilization in the face of a surprise attack takes too long. In spite of the relatively short distances the reserves had to travel to their assembly points or to the front, and including the time to organize into defensive units, at least 24 hours passed before the first reinforcement of the Golan Heights front and 48 hours passed before the troops on the Sinai front were reinforced. The mass of the reserves were organized into ready reserve units prepared for counterattacks and became completely effective only in the later counteroffensive.

". . . the time for mobilization in the face of a surprise attack takes too long."

It was not any different in the case of the materiel designated for mobilization. It was also days before this materiel could be made available to the troops. Pictures of resupply to the front repeatedly showed small busses and trucks which were still lettered with the names of the civilian firms from which the vehicles had been confiscated. Also, civilian automobiles were used as command cars without being painted over. One phenomenon was the transmission of information to the reserves—the majority of whom were in the temples celebrating Yom Kippur. It is unique in Jewish history that church services were interrupted in order to give the reserves the opportunity to comply with their orders. In spite of the peace one expects to be observed on a religious holiday, all the mass media, which really should have been resting too, were constantly broadcasting call-ups for the reserves. Also, the transportation means, which should have been resting, immediately began to transport reserves to their assembly points or to their units. Only thus was it possible to send any reserves to the front within the first 24 hours.

The necessity for defensive preparedness, which is fully supported by the Jewish population and which has become a part of their flesh and blood, was constantly emphasized by the government. In this way, the gaps which had occurred in industry, trade and commerce when the men were called up could be closed almost immediately. Even the best organization cannot achieve this so swiftly if its people are not totally [or if they are only partially] psychologically prepared.

Lessons:

- a) In the face of a surprise attack even the best organized mobilization takes too long.
- b) An elastic system of improvisation is necessary.
- c) It is necessary for the reserves to reinforce counterattack units first and reinforce counteroffensive units later.
- d) The mobilization must be well-planned to include military defense as well as civil and economic measures.

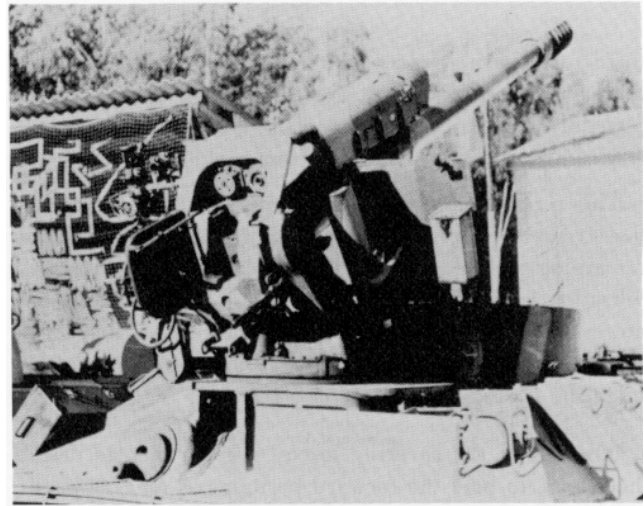
- e) During the mobilization, use must be made of all means such as the mass media, the mails, the police, public means of transportation, etc.
- f) The people must be prepared to defend. They must stand without reservations behind the government and be aware of the measures it is taking in order to support these measures and to close any gaps caused by the calling up of reserves.
- g) Mobilization for today's modern war must proceed very swiftly and be all inclusive even when it appears to be only partially necessary.
- h) Piecemeal mobilization gives the attacker the opportunity to prevent a later complete mobilization.
- i) Fear of escalation can lead to miscalculations and increase the risk of not being prepared to defend.
- j) Since mobilization can also act as a deterrent, it does not necessarily have to lead to escalation. It can strengthen the political steps taken and because of that it becomes a strong point.

The Problem of Weakly-Manned Positions

The success which the surprise attack brought to the Arabs on both fronts in the first three days of the war shows the problem of positions at the focal point of the action which were too lightly manned and the necessity for strong and maneuverable counterattack units. Within a few hours on both the northern front and the western front, the Arabs were able to achieve penetrations into the forward defensive installations and a partial rolling-up of the positions.

The counterattack reserves were too weak and were able to prevent a breakthrough only with difficulty and heavy losses and were able only after necessary [planned] withdrawals to cement the front. Only when the first full-strength reserve units were able to conduct successful counterattacks did the fronts stabilize, attempts at a breakthrough could be thwarted and the enemy could be forced to slow down his advances and to revert partially to defensive operations in the captured Israeli positions.

Could the covering forces have been able to repulse the attack more successfully using more flexible battle plans? On the Suez Canal as well as on the Golan Heights the construction of key positions to guard the wide defensive sectors was necessary for three reasons. First, these positions were to form the backbone of the defense; second, they were to provide accommodations for the troops; and, finally, they were to make possible an uninterrupted surveillance of the demarcation line. In addition, the desolate terrain on both fronts stipulated this requirement. At least since the Second World War it has been known that any fixed defensive line, even if it is strongly fortified, can be breached with modern weapons. Only a deeply



Captured D-30 mounted on T-34 chassis.

echeloned defensive system, adequately manned, makes it possible to intercept and seal off the enemy. The defensive installations only partially achieved this goal. On the Sinai peninsula it would have required the depth of the entire peninsula, which was, however, too much for the defender's forces. Only 8,000 Israeli soldiers in two brigades secured the 160 kilometer Suez front; on the Golan Heights stood one brigade. That is why smaller counterattack units which were held ready could neither throw back the massed attacks across the canal nor prevent the rolling-up of the Israeli defensive system, but they could, however, with heavy losses, prevent the breakthrough through the peninsula and contain the enemy in the positions he had just captured until reinforcements arrived and counter operations began.

"The troops in the defensive positions at the critical point are always too weak. . . ."

How strong do the positioned troops and the reserves have to be to guarantee a defense near the border? It depends on the objective and the missions of these troops. If they are to deny the enemy any success, they must be very strong; if they are to cover the mobilization, they can be weaker; if they are merely to insure the deployment [of friendly forces], they have to be stronger than the covering forces [normally used] in front of a defensive position under construction.

Examples from the Last War

In German tactics between the world wars, one estimated two-thirds of the troops for the defensive and one-third

for covering forces which had the mission to detect the enemy's attack and to slow it down so that the main [friendly] forces could prepare the defense and the artillery could destroy the enemy in front of the forward lines.

This proportion with the same missions might also suffice to protect the deployment [of friendly forces] if no remaining mobilization has to be completed or if the mobilization is practically finished. It is a different situation, however, if a full mobilization is required. In that case, the proportion of covering forces to the mobilizing forces might be nearer 1/3:1/3:1/3.

It would be the covering forces' mission then to detect the attack, to hold the forward positions as long as possible in order to force the enemy to disclose his intentions and, while holding the flank positions, to give ground only along the main axes of advance. The main defense forces would then have the mission to conduct strong counterattacks, taking advantage of the [friendly] flank positions to destroy the enemy's spearheads and prevent breakthroughs in order to make it possible for the mobilizing forces to deploy at the initial points and prepare for counter operations. In all cases, the air force supporting the ground forces and the forward border troops will have to carry the main defensive load during the first phase. The high losses of the Israeli Air Force and border troops have made this clear.

Lessons:

- a) Fortified positions, even if they can be broken through with modern weapons, are now as before an excellent tool for the defense if they are appropriately planned into the operation.
- b) The troops in the defensive positions at the critical point are always too weak because the enemy can concentrate his attack on a narrow sector.
- c) Sufficient counterattack forces must be available for immediate commitment to throw back enemy penetrations.
- d) Breakthroughs can only be defeated by strong counterattack forces and in doing so [the counterattack forces] have to take advantage of the flank positions held by friendly forces.
- e) Troops positioned near the border must be kept as strong as their mission requires:
 - If they are supposed to repulse the enemy completely, they must be very strong.
 - If they are supposed to force the enemy to deploy in order to give the defense troops time and space to establish a prepared defense, their proportions should be about 1/3:2/3.
 - If a mobilization has to be conducted, a third of the

total force must act as security near the border and a third must be committed immediately to the defense in order to make it possible for the final third to mobilize.

Attack

Objectives—Results—Defense—Losses

As already mentioned, the Arabs' attack objectives are not yet completely clear. One thing was clearly announced by the joint Egyptian-Syrian headquarters, however: "We want to reconquer the territories occupied by Israel since 1967." To do that would have required the occupation of the Sinai peninsula, the Gaza Strip, the area east of the northern Dead Sea and the lower Jordan as well as the Golan Heights. Although Jordan, as has already been mentioned, did not take part in the direct attack, the Egyptian and Syrian armies which were prepared to fulfill these missions were so superior in strength and armament that with successful breakthroughs in the Golan Heights it would have been possible to occupy northern Israel around Haifa and after the occupation of the Sinai peninsula to seize the southern part of Israel-Negev. If that were the case, Lebanon and Jordan also would have been forced by the mood of their armies and people to participate in the direct attack. In that way, the "rump steak" around Jerusalem and Tel Aviv would have been completely surrounded and cut off. Considering this, it can be assumed that if the conduct of the battle had been successful, after the first objectives had been reached, further advances into Israel's heartland would have followed.

". . . the Israelis as defenders in the first 48 hours must have suffered very high losses"

The successes of the united Egyptians and Syrians were relatively great in the first days of the war as a result of the surprise achieved and the massive commitment of heavy weapons after excellent preparation. The surprisingly good fighting spirit of the attacking troops also contributed significantly. Their enthusiasm slackened only when the Israelis' resistance stiffened through the arrival of reinforcements filled up with reserves and the attackers began suffering heavy losses. This change occurred on the fourth day and deteriorated into a battle of materiel attrition in grand style, especially on the Golan front but also on the Sinai peninsula. At this point in time (about the middle of the first week of the war), the

Soviet Union and later the USA began their preparations to replace the large losses of weapons suffered on both sides by delivering large, modern equipment, especially electronic weapons systems such as surface-to-air and antitank rockets. This produces a timetable for attack and defense: Start of the attack: Sunday, 6 October 1973, midday. Mobilization: Practically finished in 48 hours; the armed forces [of Israel] were strengthened from 115,000 to over 400,000 men. Stabilization of the fronts: After 72 hours to 96 hours, that is, from 9 October till 11 October 1973. Also the navies of the participating countries came into action.

Although both parties kept quiet about their own losses and made known only enemy losses—which for propaganda reasons were probably strongly exaggerated—it can be established [through estimation] that the Israelis as defenders in the first 48 hours must have suffered very high losses, especially in men and aircraft. Because there was less available cover for the attacking Arabs, their losses were probably greater in personnel and their losses in aircraft probably counterbalanced those of the Israelis.

After 48 hours this picture also changed. Through the commitment of heavy weapons [tanks and artillery pieces] on the Israeli side, as well as through the early successes gained by their air force through heavy fighting and through the aggressor's forsaking his air defense rocket umbrella as a result of his success, the attacker's losses in men as well as material increased sharply while the Israeli losses remained low.

Lesson:


- a) Publicly pronounced attack objectives need not be correct. If they are easily achieved, the success can tempt one to set further objectives if these haven't already been planned secretly in advance.
- b) Each successful surprise brings the attacker advantages and the defender disadvantages.
- c) The strategic plan for the defense must include this consideration and counter the attacker's advantage as early as possible by mobilizing quickly, concentrating reserves and committing all means.
- d) The defender's losses at the beginning are extremely high because of the attacker's strong local superiority, the massed commitment of his weapons and the possible protection provided by his air defense rocket umbrella.
- e) The losses first decline when the defender is able to slow down the enemy's initial momentum, to lure him from under his rocket umbrella, and to reestablish the balance on the battlefield through the massive use of defensive weapons; then the losses decrease by leaps and bounds.

". . . make clear to your own population the necessity for being prepared to protect their freedom. . . ."

f) To that end, the defender must give up terrain on occasion in order to lure the enemy from the security of his air defense umbrella so that the defender can employ his own air force more effectively without greater losses, and can let the artillery go completely into action under his own rocket umbrella, if possible, without tying up his own defensive troops in useless counterattacks; one must therefore conduct a mobile defense as a joint land-air operation with the objective of destroying the enemy or weakening his attacking force in order to win back the previously deliberately given up terrain through counteroffensives.

Summary of Part I

The lessons which have been drawn from the first phases of the war contain many platitudes which, to some extent, fall into oblivion or are laid aside because they do not fit under one or the other concept. However, if one looks at them together with the other lessons, then they are fully entitled to stand beside the others and they must be respected if one does not wish to run the risk of losing one's freedom. Therefore, what matters is:

- Thorough intelligence to prevent surprises at any price, to evaluate the results of intelligence clearly and to the point, and not to strew sand in one's own eyes.
- To arm, train, maintain and support your own armed forces as modernly as possible to meet the worst possibility; to commit strong segments of these forces directly on [near] the border in order to be able, supported by these forces, to conduct a policy of détente combined with security.
- To make clear to your own population the necessity for being prepared to protect their freedom with all means available and in that way to guarantee a total mobilization so that an enemy conducting a surprise attack does not have a chance even in the first phases of the attack.
- To make preparations for the defense in such a way that a required mobilization shows no escalating effects, even if such is alleged by the enemy; to act as the situation dictates regardless of the enemy's claims.
- Not to accept the enemy's allegations without proof, but to be aware constantly that ruse and deception are not only employed militarily. 

a Vietnam POW tells his story

CAPTURED

by
CPT William S. Reeder Jr.

"... taking fire at three o'clock Taking hits, taking hits -- we're going down."



In May 1972 I was completing the fifth month of my second tour of duty in the Republic of Vietnam. I was assigned as a platoon commander to the 361st Aerial Weapons Company "Pink Panthers." We flew Cobras and were based at Camp Holloway near Pleiku.

The military situation in the Central Highlands was serious and getting worse daily. No American ground combat forces remained except for a handful of security elements. The remaining Army aviation was supporting Vietnamese units, convoys, other aircraft and destroying trucks and tanks. Since April the enemy had captured all fire bases north of Kontum City, the installations at Dak To and Tan Can and controlled all roads and territory north of Kontum except three widely scattered camps at Polei Klang, Ben Het and Dak Sieng. Within weeks, many aviators and crewmen were wounded, several aircraft were shot down and a number of aviation and ground personnel had been killed or were missing. The communist spring offensive of 1972 was on.

On 9 May I awoke as usual at 0500 and began preflight at 0530. I was flight leader for a flight of two Cobras. Our assignment was to standby at Holloway and await a mission which would probably be a TAC-E (tactical emergency) if today was to be like so many others in recent weeks. My copilot/gunner was 1LT Tim C. who had just come to the Panthers a few weeks earlier and had been flying with me nearly every day since. He was eager and extremely competent and in a very short time had proven himself to be one of the best frontseaters in the unit, besides being a likeable guy. My wingman was CW2 Steve A. He had just over two weeks left until his deros and I planned this to be his last mission. Steve and I had been on many, many missions together and had worked well as a fire team in some very stressful combat. In his front seat was CPT Bob G., another platoon commander who was filling in with us today. Bob and I knew each other from OCS at Fort Sill where he had been a few classes behind me. This was the team and we had our assignment—standby.

Shortly after sunrise we received a mission. "TAC-E! Tanks at Polei Klang. You will be covering Hawks Claw. Contact him on his push when

airborne." Hawks Claw was the call sign given to the UH-1 tow missile aircraft that had just come to Vietnam as a tank killer. From this day on they would establish quite a record.

We arrived at Polei Klang to find the tanks temporarily withdrawn into hide positions. As we began our search for the concealed machines, we received a message to divert to Ben Het several miles north where tanks were coming through the wire along with masses of infantry, and where American advisors were on the ground. At Ben Het we saw tanks, several of them in the open around the camp. Hawks Claw maneuvered and rolled in through clouds which were getting thicker and lower. Fifty-one caliber fire came up from numerous locations. TOW scored and pulled off . . . all back to Kontum to refuel and rearm.

The clouds were building and the holes were becoming fewer and smaller. We went back out on top and found a large hole east of Ben Het to come through. The cloud bases were 1,500 feet above the ground.

"Panther 36, this is Claw. Contact Rocket 44 on FM and cover him into Ben Het. He's making an emergency AMMO resupply."

"Roger, Claw. You guys be sure to hold well to the east away from those 51s. We'll be back with you in a few minutes."

I called Rocket 44 and found that he was inbound in a Huey probably being flown by a crew from the "Gladiators" (57th Assault Helicopter Company). They were about the best in the business and we had often provided their gun cover.

The situation was not good. Tanks and infantry in the wire, 51s and small arms all around the camp and weather that would not allow us to cover the slick from above the clouds. Should we go in just below the clouds or on the deck? We would be great targets for the 51s if we flew just 1,500 feet; so in we came, low level (a sound tactic for this situation). The Cobras fired a clear path all around the slick. He made it in OK, kicked off his load and started out. Tracers were coming up all over. We turned outbound still shooting. A stream of big red tracers went by my right side, but was beyond turret traverse!

"This is Panther 36 taking fire three o'clock . . . Taking hits, taking hits—we're going down."

The bullets raked the aircraft. It felt like a jackhammer pounding along the side. We kept taking hits—from rear to front. Directional control gone, engine out, fire and rounds in the cockpit. I was hit, but it didn't seem to be

bad. Collective was down, rotor rpm OK. Memory is vague from here. Pitch pull is difficult; probably hydraulic loss. We hit the ground hard, but we're upright; we can both get out. (I found out later from an eyewitness report that we came down turning and burning, impacting on the left side of the nose, then bouncing up, turning some more and down again.) Smoke and flames were filling the cockpit. I called to Tim.

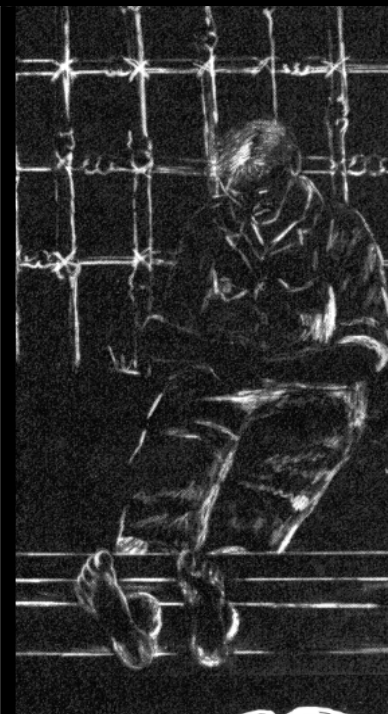
"Let's get out of this thing." (Paraphrased)

"Roger that."

Somehow I got out. I regained consciousness lying face down in the dirt hearing explosions and rounds cooking off behind me. I didn't know where I was or what had happened and I couldn't move. There was awful pain in my back.

I tried to think. What had happened? I thought I had been shot down in a OV-1 Mohawk (which I had, three years before). "My observer is OK. He ejected before me." The pain in my back was terrible. I had to get help. I had to get to a hospital. I wanted to get to my radio. I tried to move my hands. I tried again. Finally, I could move my fingers and then my arms. With extreme difficulty I took my radio out and keyed it. Nothing. The on-off/volume knob had rotated on, and the battery was dead. (A "fine" new radio that had been procured to replace the old one. But the old type worked. It could not be jarred on accidentally while in the survival vest as this

*"My heart fell
and I cried
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war."*



"By the time he finished with me . . . he tied me to a tree, beat me and threatened to shoot me."

"I was scared stiff, but refused to show it."

new type could.) What a sunken feeling. Momentary despair, but then a motivating thought. I couldn't just lie there or I'd be found by the enemy; I'd be killed or captured. I had to move.

I got my helmet off and wiped my forehead. My hand came down covered with blood. It was all over my face, but I couldn't tell where it was coming from. Successfully rolling onto my side, I looked down and saw a small piece of metal sticking into my right boot. Now I tried to move my legs. They responded slowly, but I pulled the fragment out only to find it had gone through the boot and into my ankle. I crawled. I was moving! "I would get home," I thought.

I crawled on. I had to get away from the enemy. My mind wasn't just right. What had happened? I began to realize that the Mohawk episode had been years before. This time I had been flying a Cobra. "A Cobra!" Where's my copilot? Where is the aircraft? And where was I? I didn't know.

After coming to the edge of an open area I passed out again. Sometime later I was awakened by sounds of a helicopter. I used my signal mirror, but nobody came in for me. "Probably best," I thought. "No use losing another helicopter." I could hear weapons firing in every direction. Must be enemy all around me. Then it rained and I got wet and cold.

I lay there thinking—trying to remember. Slowly things began to fall into place. I was really worried about Tim; I wanted to go back to the helicopter, but I didn't know where it was. I knew he had been conscious after we crashed and surely must have gotten out all right. He had a radio, too, and odds were that his should be working.

Bombs started falling. I had to get farther away from this area. They would be bombing all around Ben Het tonight. I formulated a plan to travel southeast to Plei Morong (southwest of Kontum). I figured the distance to be about 30 or 40 miles and thought I could make it within two weeks.

Helicopters! I heard them coming in a short distance away. They must be getting Tim. Two choppers were now flying toward me. It appeared to be a flight of Cobras. Excitedly, I reached for my strobe light and turned it on. Surely they must see it. Then I saw the stream of minigun tracers coming right at me. I dropped the light and dove away. That was close—no more than a few feet.

By early morning I was able to stand and walk for short distances, but the pain was terrible. I found to my dismay that I could not

control my bladder. I got to the edge of a large field and rested.

A FAC. I could hear an 0-2 aircraft approaching. As he came overhead, I shot a pen flare. He circled a few times, then another FAC showed up. Two of them in a big slow circle. I fired another flare. Tat-tat-tat. Some enemy had seen me and I was taking fire. I lay low for a few moments, but the rounds were zipping past me and I heard shouts getting closer. I dashed (seemed like a dash—probably more of a feeble hobble) away. About 100 yards away I crossed a small stream, followed a trail for a few yards and then plunged into the brush. I was as silent as possible. The communists crossed the stream and came down the trail firing at random into bushes. They passed me and continued.

I moved on, staying off trails and traveling cross-country. I would have to eat something to keep me going. I found some good looking leaves and employed some old survival training. Eat a minute morsel and wait half an hour. If illness does not strike, eat a slightly larger portion and wait a like period. Then eat all you want. Leaves aren't too high in protein, though, so I supplemented my diet with ants.

A Vietnamese Birddog (observation aircraft). Another pen flare. No luck.

That evening I tried to get some sleep. There were B-52 strikes and other airstrikes most of the night. A few were almost on top of me. It rained again. I fell asleep in the mud.

Morning began my third day in the jungle.

It seemed my back hurt more than it had before, and now I could feel some cuts on my head and chin. But there was walking to be done, so I got to it.

I was crossing an area of bomb craters when another FAC appeared. I began waving my arms. He circled. I thought for sure he saw me, and felt I was far enough from the battle at Ben Het to allow a helicopter to come in, but no helicopters came. Instead, a flight of F-4s was put in on my position. The FAC must have thought I was NVA. I dove into one of the existing craters and clutched the side. The world exploded around me, but I was untouched. The aircraft left and I continued my journey.

I stopped for lunch under some bushes along the floor of a small valley. I wasn't very hungry, but I forced some nutrition down. There was something on my leg just above my boot that looked like a large swollen worm. I tried to flick it off, but it didn't budge. I grabbed it and tore it off. It was a leech.

Travel is slow and difficult through the jungle. It is tiring and at times frustrating. The vegetation at this point was so thick I couldn't see more than a couple of feet. I moved on, determined to get home.

I heard shouts just a few yards away. They were clear and sharp, and not in English. I crouched down and froze. In seconds there were five fatigue-clad NVA surrounding me with AK-47 rifles pointing at my head. My heart fell and I cried inside. As I raised my hands and stood up, I became a prisoner of war.

That first day was one of fear and anticipation. I didn't know if they would let me live or kill me. From my point of capture I had been taken a few feet to a trail, then several yards to the edge of a complex of bunkers. The soldiers who captured me were young and seemed startled, a little afraid and very inquisitive. They even appeared to show some concern for my condition, giving me water, rice and even a cigarette. I must have been a sight—dirty, bloody, unshaven and in much pain. We communicated with gestures and some of them even cast pitiful smiles toward me. But if I thought this was to be representative of my treatment, I was wrong. Soon I was searched and had everything confiscated including my boots and socks. When they pulled the right boot off, I saw that my foot was caked with dried blood. That wound looked a little worse than I had thought. I did get to keep my flight suit.

Some time later an English-speaking interrogator arrived on the scene. He was a jewel. By the time he finished with me that evening he had tied me to a tree (which was murder on my back), beat me and threatened to shoot me. I gave him nothing but my name, rank, social security number and date of birth. I was scared stiff, but refused to show it.

These sessions went on for two days. At night, I slept in a muddy hole in the ground. On the third day, I was told to exercise, and then was given my boots back with no laces or socks. The interrogator arrived and told me I would travel for two or three days to an area safe from bombing and artillery fire. A rucksack of uncooked rice was put on my back. It was hard to keep from screaming. As I left with two guards the interrogator said to me, "Try to make it."

Three agonizing days later (three days of dodging airstrikes, getting blisters, removing leeches, staying on my feet by what means I don't know and listening to my guards say, "Go quick or you die.") I arrived at my first real prisoner of war camp.

The camp consisted of numerous bamboo cages surrounded by two 10-foot bamboo fences. The tops of the fences were sharpened and a punji stake moat was between the fences. I was to find out later there were about 300 South Vietnamese prisoners in this camp.

I was taken to a pool in a small stream that ran through the camp and told to wash myself. This pool was used for bathing (infrequently), laundering, washing surgical instruments and for drinking water. When I finished I was put in a cage with about 26 South Vietnamese and my feet were put in wooden stocks. The cage had dimensions of 12 feet by 20 feet by 4½ feet.

I lived like an animal in that camp for nearly two months. There were daily interrogation sessions for two weeks . . . then only once a week. We got a grapefruit-size ball of rice twice a day, and water. We were allowed out of the cage once a day to use the latrine, which was a mass of filth and flies. Rats ran over us at night. I was given no medical care and my ankle wound began getting infected. I was losing weight rapidly.

I had heard there was another American in the camp and I told the interrogator I wanted to see him. "In time," I was told. Finally, I was moved to another cage and there I met CPT Wayne F., United States Army. Wayne had been shot down and captured about a month and a half before I was. He appeared to be in fair shape, but very skinny. I was soon to match him as I continued to suffer from the diet of rice. Then Wayne got dysentery. I thought he was going to die, but he pulled through after several bad days.

We left that camp in July. Both of us looked like walking skeletons. We could barely walk, but were told to do our best as we were going to a new camp where the food would be better. They said the new camp was far and we might have to walk for as many as 10 days. It didn't take 10 days.

To describe that journey from Northern Cambodia to Hanoi, North Vietnam, would take a book which I may write someday. It was a horror-filled march for the Americans who walked it. Death stalked the trail. For now, let me just say that it was the most terrible experience I have ever had. My back ached. I got dysentery. My leg became so infected that the communists were going to amputate, but tried penicillin first and it worked. Nightmares and strange dreams were my nightly companions. Wayne and I started that trip with 25 South Vietnamese officers. Wayne and four of the South Vietnamese died along the way.

"It was a horror-filled march Death stalked the trail."

". . . Hanoi was very nearly paradise"

On 10 October I arrived at a camp in Hanoi known as "Plantation Gardens." The journey north was over. It had taken over three months. I was placed in solitary confinement for a few days and then moved into a room with seven other Americans. After the past five months, Hanoi was very nearly paradise, though this impression very quickly subsided. The food was better, though, and some medication was available. We had a fine SRO (Senior Ranking Officer) in COL Ted G. He gave us guidance and inspiration. But best of all was the companionship of other Americans. It had been about two months since I'd seen another American.

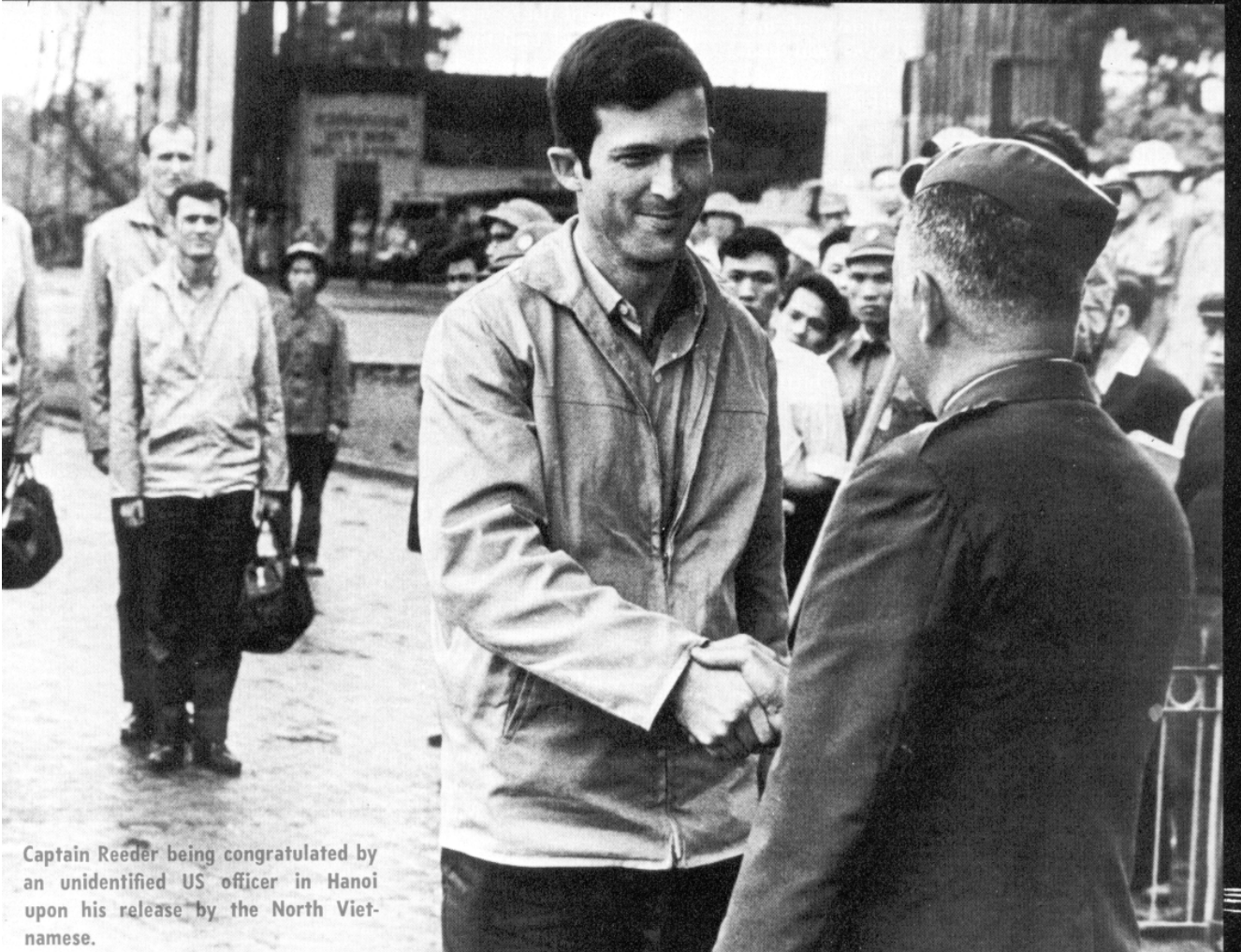
Conditions at the Gardens had been improving drastically before I arrived, and they continued to improve after I got there. The end of the war was near. The North Vietnamese, through some strange logic, were trying to make a good impression on us at the end, hoping this would be the impression we would bring home with us. They were wrong.

In mid-December the bombing started again. I didn't know what had gone wrong, but I was glad to see the United States showing her strength. The bombing lifted the spirits of most POWs.

On 27 December 1972 we moved to the infamous Hanoi Hilton where I remained until my release on 27 March 1973. At the hospital in the Philippines I found that I had broken my back. I was treated for malaria and three kinds of worms—and I ate.

But I still had some unfinished business. I wanted to find out how my copilot was. I had looked forward to having a drink with him when I got home. I couldn't believe the words coming over the phone. Tim died. He was picked up by the helicopters I had seen that first night, but was dead by the time they got him to the hospital. I hung my head. ☒

CPT William S. Reeder Jr., FA, is now assigned to the 9th Infantry Division, Fort Lewis, WA.



Captain Reeder being congratulated by an unidentified US officer in Hanoi upon his release by the North Vietnamese.

EIGHT STEPS FOR SURVIVAL IN A POW CAMP

(1) EAT. Sounds simple, doesn't it? But, when you've got to force down nothing but plain, boiled rice day after day, month after month, eating becomes a difficult chore. Some found death easier.

(2) PRACTICE PERSONAL HYGIENE. When you are sick and starving, it is hard to motivate yourself to keep your body and your surroundings clean. Do the best you can with what you have. Filth leads to disease, and disease leads to death.

(3) EXERCISE. Set up a daily exercise period. Do something. Even if you are in stocks and chains you can at least flex a few muscles and do some deep breathing.

(4) DO NOT GIVE UP THE FIGHT TO STAY ALIVE. No matter how sick you are, how serious your wounds, or how hopeless the situation there is always a chance you can make it. Take that chance and, with your deepest courage, fight for it.

(5) ESTABLISH COMMUNICATIONS WITH OTHER PRISONERS. Use your initiative and imagination to make contact with others, and then develop a chain of command.

(6) FOLLOW THE CODE OF CONDUCT. You must know the Code before you find yourself in a prison camp. Then you should adhere to the articles as strictly as possible.

(7) KEEP THE FAITH. Faith in your family, your religion and your country may be all that keeps you alive and sane. Hang in there; you are not forgotten.

(8) MAINTAIN A SENSE OF HUMOR. This is difficult, but both possible and necessary. A bit of humor helps keep away fits of total depression, and remember, depression can kill.

CPT William S. Reeder Jr.

New French SP 155-mm

"Grande Cadence de Tir"

by LTC Ludovic DeDinechin
French Liaison Officer, USAFAS

***D**URING the 1972 "Day of Artillery," the French Field Artillery School (Chalons sur Marne) provided the setting as a prototype of a new self-propelled 155-mm gun was revealed to the French artillery community. The 155-mm "Grande Cadence de Tir" (GCT, high rate of fire) is the product of several years' research and development.*

The gun, an ingenious weapon, fills the need for an artillery weapon by combining the following capabilities: the mobility of battle tanks, a quick reaction time to engage targets in any direction, a high rate of fire, longer range than now available and protection in a nuclear, biological and chemical (NBC) environment.

The self-propelled 155-mm GCT provides all this and more. It features rapid mobility, increased firepower and range, flexibility and complete NBC protection with a reduced crew of four men. Development of the gun gives an unusual look into the French research and development system. The first studies, begun in 1967, were aimed at creating the equivalent to required operational capabilities (ROC, Fiche des Caracteristiques Militaires). Defining ROC characteristics of a weapon system is the responsibility of the French Army General Staff. Agencies of the French Army attended symposiums designed to gather ideas to establish the ROC for the 155



Front view of the new French self-propelled 155-mm GCT.

GCT. Those agencies included the Etat-Major de l'Armee de Terre (EMAT, Army General Staff); Direction Technique des Armements Terrestres (DTAT, Technical Directorate for Ground Armament); and Section Technique de l'Armee de Terre (STAT, Technical Section of the Army).

The completed ROC was approved by the Army Chief of Staff. The Ministerial Delegate for Armaments (DMA) was notified of the approval. The DMA received additional information on the time-phasing, the funding limits, the projected number of systems and possibilities of international cooperation. It was at this point that the development separated into five phases:

- Program definition, conduct of studies.
- Engineering, design of prototypes.
- Industrialization, development from prototypes.
- Pre-series and operational tests.
- Manufacturing, acceptance, entry into the Army inventory.

The pre-project was presented in September 1969, and pre-project prototypes were accepted in January 1970. Two prototypes have been built; the first was completed in January 1972. Engineering tests were conducted (1972-73) to insure reliability, ruggedness and performance.

A nine-month development test was conducted in 1973 in Bourges, Satory and on numerous ranges. Thousands of rounds were fired resulting in modifications to the prototypes. Final steps were made in preparation for industrialization and submission of a contract.

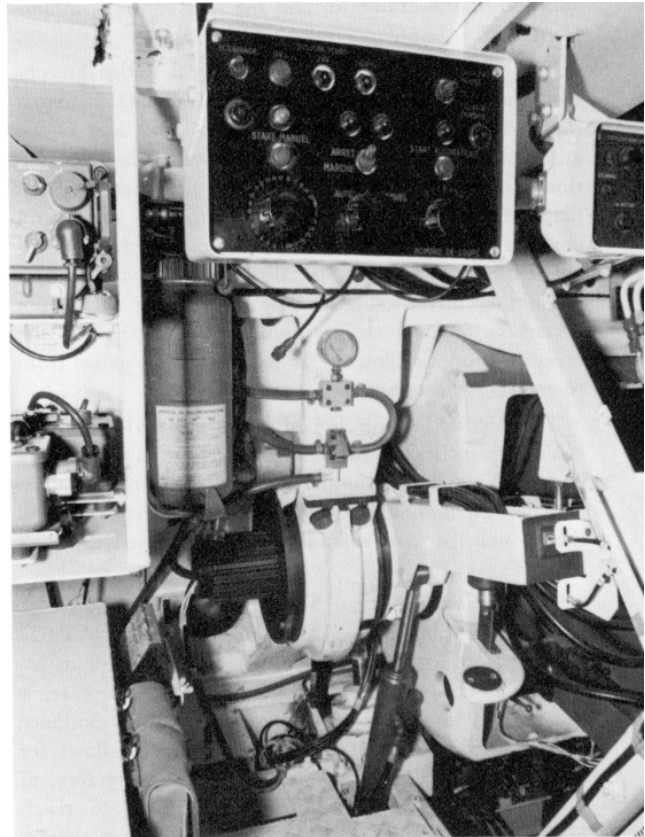
The decision to develop a "pre-series" for the 155-mm GCT has been made. The operational testing, with a complete battery, is scheduled to begin in the near future. The series manufacturing rate will be decided following an analysis of the testing by the Army Chief of Staff. If the testing is successful, the gun will be approved.

The final hurdle follows the gun's actual construction. Acceptance tests will be conducted by the Service de Surveillance Industrielle des l'Armements (SIAr) before the equipment is taken into the ordnance inventory.

Considerations

Various technical and tactical considerations were underscored during the development of the 155-mm GCT.

Experience revealed the need for a gun of at least 155-mm, a 6,400-mil capability and a 25-kilometer range with modern ammunition for direct support of brigades committed on wide fronts to mobile actions opposing an armored and mechanized enemy. In addition, tests conducted during the last years have shown that the effectiveness of the first rounds of the fire for effect on



Interior of the French gun showing the automatic loading control device.

an unaware enemy is better than that of subsequent volleys. From this comes the interest in acquiring a high rate of fire (six rounds in 40 to 45 seconds) and the automatic loader. The need for NBC protection was indicated for the fire support of tank battalions exploiting nuclear strikes. The weapon system must be capable of following the tanks at their own tempo, on devastated or contaminated terrain.

Finally, the vehicle must retain a good level of supplies, enabling it to conduct an action of some duration without resupplying.

It was easy to deduce from these considerations that an entirely new weapon system (showing an evolution—if not a revolution—from the current systems) was necessary. The self-propelled 155 GCT was to feature FIREPOWER, MOBILITY and PROTECTION.

Firepower

The weapon, 40 calibers, features hydraulically-powered elevating and traversing mechanisms. The turret has a 360° traverse and elevation is obtained through

rotation of the cradle around the axis of the trunnions from -5° to $+66^{\circ}$.

The gun* is equipped with a vertical wedge breechblock hermetically sealed by means of a metal blanking piece. The breech is hydraulically opened and closed automatically and includes manual capabilities. Installation of the gun in its cradle, and of the cradle on the front plate of the turret, provides for hermetical sealing regardless of the elevation. The recoil mechanism, of conventional type, can be disassembled without disassembling turret artillery. The breechblock includes a percussion control device (with a backup) and the breech includes a blowing device preventing gasses from re-entering the turret.

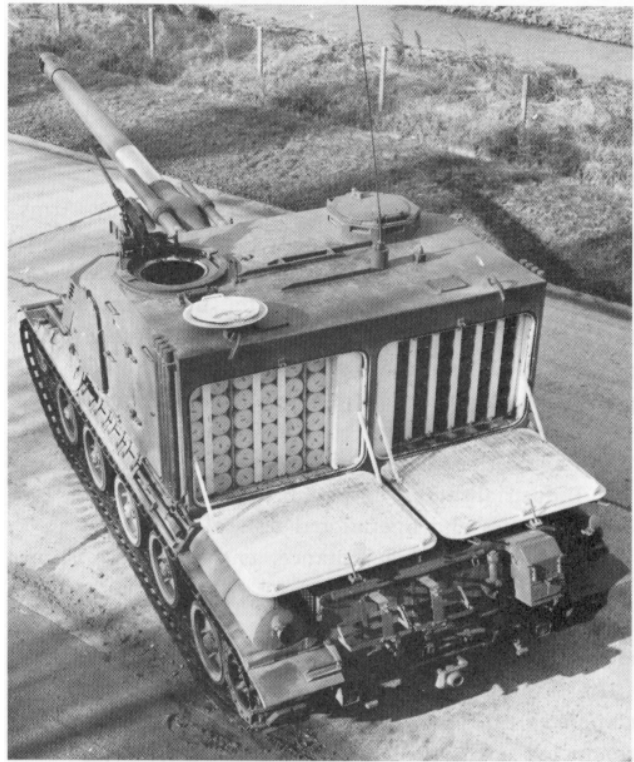
The 155 GCT will fire all ammunition made by NATO countries. As far as the French ammunitions are involved, the family under development includes HE anti-personnel, smoke-incendiary and indirect antitank which will be developed from the hollow-base shell TA 68.

The maximum range achieved by the hollow-base shell is 23.5 kilometers, with a muzzle velocity of 2,657 feet per second, zone seven. The complete round, including hollow-base projectile and combustible case, is the normal round for the 155-mm GCT; the existence of a "hollow" in the base of the projectile allows for an increased volume of the chamber and, therefore, of the propellant charge. Thus, it is possible to reach higher muzzle velocities. The shell itself has a slender profile, a rotating band on the solid part of the shell and can withstand pressures up to 43,500 pounds per square inch.

The combustible case, much easier to use than the conventional bags, is also best suited to any type of automatic loading of a cannon. The separate bags and the ignition bag are located inside the case. The propellant is ignited by a combustible primer glued to the bottom of the case and the whole case, plus propellant, is watertight. There are two sets of charges, short range (charges one and two) and long range (charges three through seven).

The automatic loading system located under the top of the turret and on both sides of the breech, includes two symmetrical sets, one designed for the loading of the shell and the other for the loading of the case. It is possible to fire either single shots, or any number of shots automatically at an average rate of eight rounds per

* According to the American terminology, this cannon is still a howitzer, considering the high angle capability, the numerous propelling charges, the range probable error and the range overlap between charges ("Howitzer or Gun?" Jan-Feb 74 **Journal**).



Projectile and powder storage racks are displayed in the "Grande Cadence de Tir."

minute. It takes 15 seconds to load the first shot, and the time between two firing sequences is eight seconds. Automatic loading is hydraulically powered, and is controlled through an electronic box energizing electrovalves and receiving its operating signals from optoelectronic sensors. Such a system is designed for maximum reliability and rapid replacement of standard components. Automatic loading is possible down to 12° slant angles, in roll and pitch.

A detection and control system initiates and supervises the timing of the sequences according to a pre-planned schedule. It is based on printed cards with the detection of movements and positions of the various parts accomplished through an optoelectronic device.

The ammunition storage area, with a 42-round capacity, is located in the back of the turret. A double hatch on the rear face of the turret can be opened horizontally, permitting access. The resupply of the 42 rounds from the regular 4.5-ton Berliet truck can be completed by two men in 30 minutes.

The loading device has been designed to load from one to six rounds automatically and, in case of a breakdown, manual loading is still possible.

Before firing, the crew must select the shells to

be fired, select the cases to be used, set a dial for the number of rounds to be fired and open the breechblock.

Fire Control

A fire control system as comprehensive as possible will be one of the characteristics of the 155-mm GCT weapon. It may include an automatic vertical finder and control, a north seeker and so on. As of now, the fire control system includes an aiming sight (five-power magnification, field of view 175 mils) equipped with a digital angle sensor. The sight is mounted on a plate keeping the sight vertical when the tube is traversed. Also included is a display unit for traverse and elevation data with a keyboard for the gunner that the chief of section can also see. There is also a power supply unit and a periscopic sight for direct fire. With the fire control system AMX 363, the gunner, whether for the initial laying or for a fire mission, must manually insert on the display unit keyboard the data which can be transmitted to him by the chief of section. However, the fire control system is designed to interface with the French automatic data processing system, the ATILA. The internal computer will then display the differences between the actual direction of the tube and the inserted data. In order to lay the tube, the gunner has to rotate the sight unit until all the displays come to zero, and by rotating the turret, bring the reticle onto the aiming point. The cannon is then traversed and elevated to the correct position. The fire control system also includes the capability of direct optical reading in case of electrical failure. This permits manual laying.

Mobility

The second feature, mobility, is met. The turret is mounted on the AMX 30 chassis. The maximum speed is 60 kilometers per hour, with a range of some 400 kilometers (250 miles). The vehicle can cross fords as deep as 2.2 meters (seven feet) after a few minutes of preparation. Loaded on a low platform car, it meets the national and European railroad transportation specifications; its width, 3.1 meters (10 feet), allows for ease of highway traffic.

The whole turret, with the complete armament and fire control system, can also fit the Leopard chassis thus fulfilling the needs of the NATO countries which adopted the Leopard as their main battle tank; the prototypes developed in this configuration have proved to be highly effective, mobile and maintainable.

Protection

Protection against conventional threats is insured by a plate which protects the crew and its main equipment against armor-piercing projectiles of light machine guns. On open terrain, the 155-mm GCT can screen itself by

using its smoke grenade launchers. In addition to the main armament which can be used for direct fire, a 12.7-mm machine gun is mounted on the turret, and can be used in self-defense against air or ground attacks.

Protection against NBC threat is achieved by the plate and the special design of the internal facilities including a pressurized crew compartment, a clean air intake, a radiation detector (DOM 410) and shock-absorbing padding made of expanded polyurethane foam. A compressor provides a slight over-pressure in the crew compartment; the tightness is obtained by inflatable gaskets around the turret rotating rail and hatches.

Fitted with these protection devices, the weapon is capable of withstanding, without heavy damage, the heat effect of 20-kiloton blast at 1,000 meters, and of fighting without significant loss of effectiveness on contaminated ground.

Crew Functions

The new 155-mm GCT requires a crew of only four men to perform all functions in combat. The gun commander is responsible for outside communication and coordination of the crew work. The gunner is in charge of fire control, traversing the turret and setting elevation. The loader prepares the charges and selects the various types of shell to be fired. Rounding out the crew is the driver who is not in action during firing sequences.

The crew will be cross-trained so the gun commander and gunner can exchange functions in the turret and the



Side view of the GCT.

Comparison of 155-mm GCT with other weapons

	<u>155 GCT</u>	<u>Swedish VK 155</u>	<u>SP 70</u>	<u>M109A1</u>
<i>Caliber</i>	155	155	155	155
<i>Length of tube</i>	40 calibers	50 calibers	40 calibers	39 calibers
<i>Range</i>	23.5 km	25 km	24 km	18 km
<i>Loading system</i>	automatic	automatic	semi-automatic for projectiles, manual for charges	semi-automatic
<i>Rate of fire (maximum)</i>	6 rounds/45 sec	15 rounds/min	3 rounds/12 sec	4 rounds/min
<i>Elevation</i>	-5° to +66°	-5° to +40°	-3° to +70°	-3° to +75°
<i>Traverse</i>	360°	30°	360°	360°
<i>Number of rounds onboard</i>	42	14	30	28
<i>Crew</i>	4	6	5	10
<i>Weight (metric tons)</i>	41	50	42.1	24
<i>Engine Power</i>	620 HP	600 HP	1,000 HP	405 HP
<i>Maximum speed</i>	60 kmph	35 kmph	67 kmph	58 kmph
<i>Length</i>	10.09 m	11 m	8.97 m	9.04 m
<i>Height</i>	3.3 m	3.75 m	2.88 m	3.06 m
<i>Width</i>	3.15 m	3.3 m	3.51 m	3.15 m

driver can replace the loader. Due to cross-training, the gun can continue to function without noticeable decrease in capability with a crew of only two men.

For purposes of information, some statistics on the 155 GCT are listed along with the figures of three other new 155-mm weapons: the Swedish Bofors VK 155, the multi-national project SP 70 (Federal Republic of Germany, Great Britain and Italy) and the US M109A1.

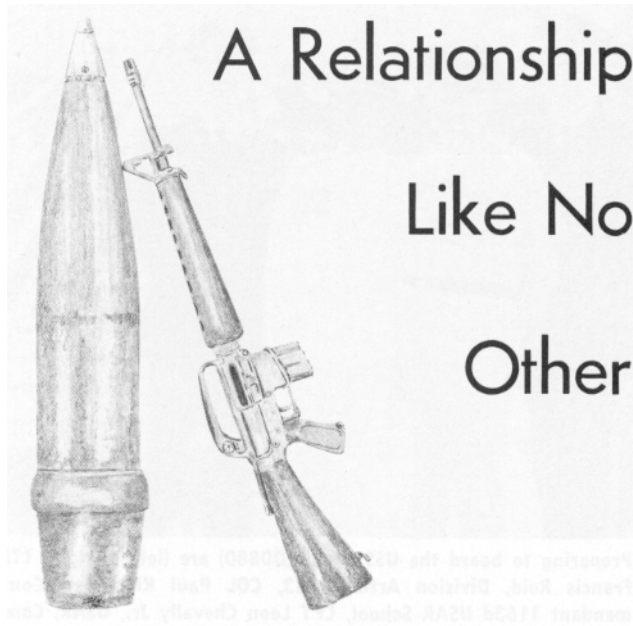
This introduction to the 155 GCT and a review of the other nations' systems under development could very well lead the author (and the reader) onto the very slippery ground of comparative evaluations such as, "My system is better than your system." However, the variety of concepts and developments involved—especially in automatic loading—does not make it an easy issue to

resolve. All the systems are in various stages of the developmental process, some are beginning to enter inventories and others will not be fielded for several years.

The combined approaches of the French system to solve the challenges of a high rate of fire appear to be both attractive and consistent; we hope the 155 GCT will prove successful during the operational tests this year so it can be fielded and the first batteries can be equipped in 1976.

In summary, the self-propelled 155-mm GCT is a beautiful cannon with an attractive loading mechanism and a reliable and thoroughly field-tested chassis. Such are the qualities of a weapon system which will be a milestone in the evolution of the French Field Artillery.





by

COL John G. Pappageorge

In combat there is an overriding requirement to keep unremitting pressure on the enemy to punish him and to rob him of opportunities to take the initiative. But men tire, machines break down and the terrain and weather at times seem to be as much an opponent as is the enemy. Yet even under the worst circumstances, the artillery can continue to maintain the momentum by fire. Furthermore, it can facilitate the subsequent employment of men (now rested and fed) and machines (now repaired and refueled) as the pressure on the enemy continues.

In this regard the infantry-artillery relationship is a special one. This special relationship is central to the entire doctrinal system by which combat power is brought to bear on the enemy in the most telling manner. This is not to deny the importance of the many other facets of projecting military power. Nor does it downgrade the importance of coordinating the personnel and logistical activities that create the conditions under which each local combat action will finally occur. In the end, however, the final measure of success rests heavily on the skill and ingenuity with which an infantry company commander, his artillery observer and the fire support officer (FSO) can orchestrate the available violence to secure their objectives.


COL John G. Pappageorge, INF, is with the Strategic Studies Institute at Carlisle Barracks, PA.

From this infantryman's perspective, two attributes are essential for the young captain or lieutenant who would become an outstanding FO or FSO. The first is his technical skill as an artilleryman. That is hardly a profound statement. Nevertheless, it needs saying. FSO and FO slots are not places where an artillery commander can hide a marginal performer; hastening to add that, in my own experience, artillery commanders have been even more aware of this than their infantry counterparts. I will not go into the details which constitute artillery proficiency. Space will not permit it and, more importantly, readers of this journal know them better than I do.

The second attribute is more difficult to describe and more difficult to acquire. Tactical proficiency is a big part of it—but not all of it. It goes beyond being completely familiar with all of the relevant doctrine. Its essence is a sensitivity and understanding of the tactical (and perhaps even the strategic) significance of events as they are planned and as they occur. It is the ability to "put it all together," so to speak, so that the efforts of all contribute to the overall effort. For lack of a better phrase, the term "combat sense" will suffice, and through the use of examples show how combat sense applies to the infantry-artillery relationship.

Knowing, for instance, that the unit he is with is expecting aerial resupply in the morning, the Redleg determines the route the helicopter will be directed to fly into and out of the defensive perimeter. He will then plan concentrations on likely ambush points along the flight path in order to respond more rapidly in the event suppressive fires are called for. As a further precaution, he places some fires during the night on the more dangerous points along the flight path. (As an aside, it should be noted that these actions force the infantry commander to more carefully plan the resupply mission if he already hasn't done so. That kind of reciprocity, incidentally, is a key element of the infantry-artillery relationship.)

Similarly, the FSO will plan concentrations on likely danger areas along the route of advance the infantry plans to follow the next day. He'll fire some of those during the night as well. Lastly, he mixes the timing and volume of his nightly fires (along the flight route, on the expected route of advance, in support of patrols and the like) so that in combination they do not give away any one of the separate goals he is seeking to accomplish.

When the infantry-artillery relationship is really right, it not only reacts well to unexpected events, it goes further. The combined technical and tactical proficiency of both parties, plus the added element of combat sense, maximize performance while minimizing the chances of being surprised. Yes, it's a very special relationship—a relationship like no other. 

Call Me "Admiral"

by COL Burt A. Vander Clute

"Call me Admiral," said BG Fletcher C. Booker, the Pennsylvania Assistant Division Commander for the 42d Infantry Division, New York Army National Guard. He had just returned from a weekend cruise aboard the USS Dyess observing the weekend firing of the destroyer's 5-inch guns and the shore support capabilities of the Navy.

"The circle has now been completed," thought LTC James J. Sweeney, the Chief of the Fire Support Element (FSE) of the 42d Infantry Division Artillery. He had enlisted in and served with the US Coast Guard prior to and during World War II. And now, 30 years later, Lieutenant Colonel Sweeney is back studying the sea arm again.

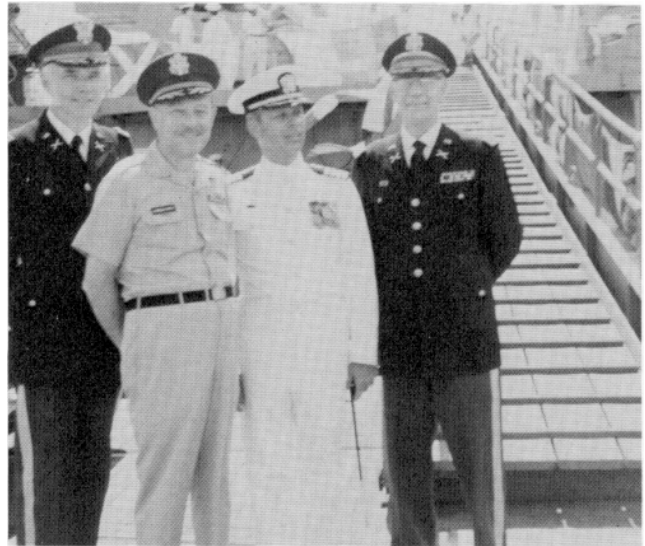
The process all started three years ago when plans were made for the FSE to be established at least a mile from the command post (CP) in the field during Annual Training at Camp Drum, NY. This was to be the first of a number of changes and improvements for the FSE that would lead them into many new fields involving the whole Army concept.

The first improvements were to the FSE itself. Because of deficiency noted during the FTX such problems as better map arrangements, fire capability overlays, a better arrangement for getting No-Fire Lines (NFL) information and better communications between the FSE and the division artillery headquarters would have to be worked out.

The map problem was solved by erecting a double-faced map board in the center of a GP medium tent. The target analysts used one side while the assistant FSE coordinators used the other. Tunnels and corridors were plotted on both maps. Fire capabilities overlays were plotted on acetate for each caliber of weapon in the div arty and for the mortar platoons of the infantry units. These were tacked down on one side and rolled back so any combination of weapon capabilities could be displayed on the map (Figure 1).

The Headquarters Battery had been issued two teletypewriters but only one power unit. Better communications

COL Burt A. Vander Clute, FA, is commander of the 42d Infantry Division Artillery. New York Army National Guard.



Preparing to board the USS Dyess (DD880) are (left to right) LTC Francis Reid, Division Artillery S3, COL Paul Kirschner, Commandant 1163d USAR School, CPT Leon Chevally Jr., USNR, Commander Destroyer Atlantic Detachment 202 and Colonel Vander Clute, Commander, 42d Division Artillery and author of this article.

came about when a second teletype power unit was purchased at a GSA auction.

Other FSE shortcomings were almost completely corrected when two new requirements were injected into the FSE operational planning. One brigade of the division was going to conduct Infantry Company and Tank Platoon Army Training Tests in what was normally artillery real estate. The brigade expected to add realism through coordination with the Air Guard, by having jet and

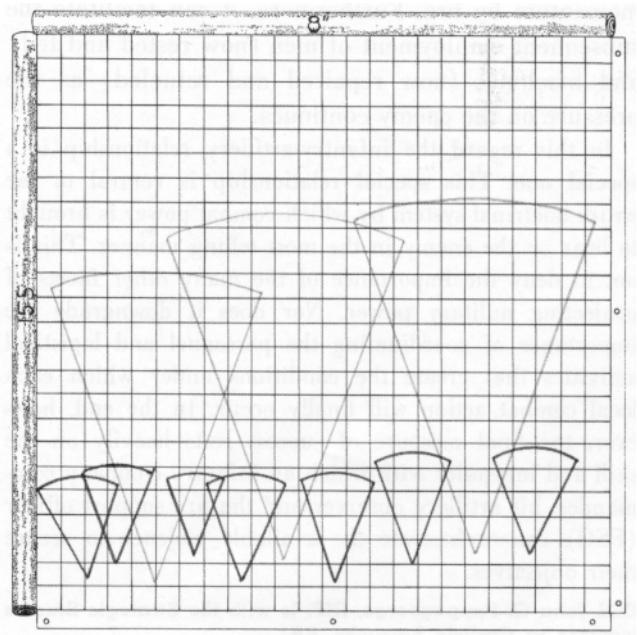


Figure 1

propeller-driven aircraft simulate strafing attacks on the infantry and tanks during conduct of their ATTs. Close coordination with the Air Guard settled the question of corridors for the aircraft and the posting of an Air Force liaison officer with an MRC-108 radio established air-ground communications for the necessary timing and clearances of the flights. Army helicopters operating through established tunnels flew inspectors, umpires and observers to their predetermined landing sites, after clearing with the FSE. At (or during) this time the FSE had under its control all mortar firing for the division, all artillery fires, jet and propeller-driven aircraft, aircraft corridors and helicopter tunnels. The FSE was far from idle. The div arty headquarters continued to give batteries their ATTs in addition to its normal command and control functions.

FSE horizons kept expanding when the Div Arty S3, LTC Martin L. Lowman, received his challenge—a modified TOE was issued authorizing aerial observers on the div arty staff. The first problem was training air observers. Discussions followed with the 1163d Army Reserve School, and they, with the assistance of div arty pilots, conducted an 80-plus hour school. The class was started on a voluntary basis and as it progressed some members had to drop out due to various reasons. Eleven stalwarts finished the course, each having completed more than the minimum requirements, including flying and air observation missions. They were a proud group as their wings were duly awarded at a div arty parade.

Still expanding horizons, the S2 and S3 took advantage of the knowledge of the Regular Army Advisor, MAJ Eddie Monroe, and with his invaluable aid, the Survey Section set up an outstanding flash base which was used during the seven battery ATTs to determine if the rounds were landing in the box. Back-up to the flash base was the direct support battalion radars and the AN/MPQ 4, which were utilized when the ground haze did not burn off in the mornings. The Metro Section sent met messages every four hours taking the data alternately by visual and electronic means. The radio messages were sent out on the AN/GRC 19 and received by the batteries and battalions on the old reliable GRR 5, providing all units and organizations with

current met data to be used in the ATTs and to correct battalion missions. The section realized its importance because it could see the temperature changes, which at Camp Drum often varied as much as 50 degrees or more in six hours.

No sooner had the Annual Training period ended than the S3 was looking for new fields to conquer and found them through the good graces of COL Paul Kirschner, an artilleryman and Commandant of the 1163d Army Reserve School. A meeting was arranged with CPT Leon Chavalley, USNR, of the Destroyer Atlantic Detachment 202, and shortly thereafter two officers and two enlisted men of the FSE were taking weekend cruises aboard destroyers to become familiar with naval gunfire, communications and procedures for the Navy answering calls for gunfire from Army agencies.

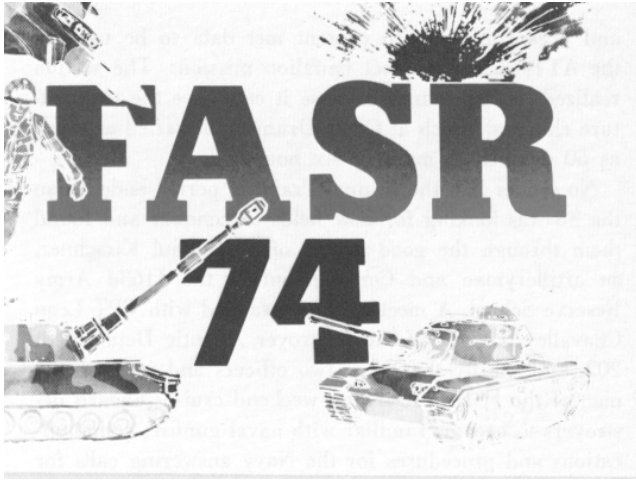
Altogether now, more than 12 officers and 10 enlisted men of the FSE and Div Arty Headquarters have been able to take advantage of the cruises and the additional knowledge gained. During a recent weekend exercise at Fort Dix, NJ, the Navy sent a group of their interested personnel to witness how one Army FA battalion computes and fires a mission. The Navy men were fascinated with the accuracy and speed with which a battery could compute and fire without the electronic equipment such as that which is available on a destroyer. They watched the rounds landing in front of the observation post and were amazed as they got what they asked for in corrections.

Members of the 42d Infantry Div Arty are proud to be a part of the one Army concept. They have been aided by the Regular Army through sharp, knowledgeable advisors who are extremely competent instructors from the Army Readiness Region and the Army Reserve Schools. In working with the Air National Guard, div arty members have expanded their knowledge of the capabilities of the air arm and, by working with the Navy, have furthered cross-service training, such as few National Guard div artys have had an opportunity to accomplish.

"Call me Admiral" is the new cry of the 42d Infantry Div Arty which opens the door for even greater vistas of training within a National Guard division artillery.

Naval personnel receiving instruction on the 105-mm howitzer at Fort Dix, NJ.





by Allen Boules, staff writer

Reviews of ongoing major field artillery developmental items, as well as product improved systems, highlighted the 1974 Field Artillery System Review (FASR) conducted for designated high-level representatives of the Department of the Army, major subordinate commands and interested agencies at Fort Sill 23-24 October. In addition to the briefings provided by the Field Artillery School, presentations were also made by representatives from the Office of the Assistant Chief of Staff for Intelligence (OACSI) and the US Army Materiel Command (USAMC).

The theme and scope of the FASR was established by MG David E. Ott, Commandant of the School, in his opening remarks and in the initial presentation, "The Field Artillery Overview."

The overview was an analysis of the field artillery contribution in a combined arms effort in a Mideast environment using the Combined Arms Combat Developments Activity (CACDA) manual war gaming technique to evaluate red and blue combat losses in the current time frame as well as a projection for the 1983 period. Emphasis was placed on the contribution of indirect fire to the overall measures of effectiveness. The analysis provided some insight into the shortcomings of present equipment and doctrine and also pointed out advantages of the new systems under development.

General William E. DePuy, Commanding General, Training and Doctrine Command, headed the list of more than 115 participants including 50 general officers and civilian equivalents attending the two-day system review.

The conference was conducted at Snow Hall and included inside and outside displays of current, improved and developmental FA weapons and associated equipment as well as foreign weapons.

A first for the FASR was the presentation, "Evolving FA Tactics and Techniques on the Modern Battlefield," by BG Vernon B. Lewis Jr., Assistant Commandant of the School. In prior reviews the presentations have been materiel-oriented. This briefing presented new techniques aimed at providing a more responsive field artillery on the modern battlefield. Tactics and procedures envisioned for support of the maneuver arms in the combined arms team concept are designed to make FA fire more effective. The majority of the briefing has been prepared in an article format and will be included in the January-February issue.

Other topics presented at the FASR included:

- The General Support Rocket System (GSR): Presentations by USAFAS and USAMC. The USAFAS briefing covered characteristics, employment techniques and the current developmental status of the GSR. It included a portrayal of the effectiveness of the GSR on the modern battlefield; its contribution to the total combined arms effort demonstrated through an adaptation of the standardized scenario which includes a GSR battery among the available FA assets of the 1983 time frame. The USAMC portion of the presentation included the results of a preliminary cost-effectiveness analysis conducted to determine the potential performance of GSR relative to alternative general support artillery systems.

- Target acquisition, survey and meteorological capabilities of new materiel developments: Presented by USAFAS and USAMC. Subjects included the AN/TPQ-37 Artillery Locating Radar, an electronic scan, phased array radar for location of hostile cannons/rockets and adjustment/registration of friendly fires; the AN/TPQ-36 Mortar Locating Radar (similar to the AN/TPQ-37 but smaller and less sophisticated), capable of simultaneous location of mortars throughout its sector scan; the AN/TPS-58A Moving Target Locating Radar, a coherent doppler radar which can provide continuous coverage of visible terrain and provides the capability of automatic tracking or artillery adjustment; the Projectile Velocimeter, a weapon-mounted device that provides the capability to determine velocity error rapidly and accurately;

(continued on page 64)

The Kingsmen Excel In Revamped ORTT

FORT CARSON—Before the morning sun touched the tip of Pike's Peak a telephone's sharp ring woke the Bravo Battery commander in his quarters. The mountain post is the home of the 4th Infantry Division's (Mechanized) Ironhorsemen. The commander, notified his unit was being alerted for an unannounced Operational Readiness Test (ORTT), started his recall plan.

Heading for the office, he recalled the initial guidance and briefings on the unannounced ORTT concept. It was back in March, as the battery training cycle began, that the Kingsmen (1st BN, 27th FA, 8-inch SP) commander, LTC Dennis S. Greene, outlined the new wrinkles to ATT 6-358, which he designed. In addition to the no-notice aspect, the modified test would require logistical resupply, split fire direction capability, employment of security augmentation, reaction to electronic jamming and imitative deception. The scenario also called for extensive aggressor and chemical-biological-radiological play.

The test modification was the culmination of three months of planning and war gaming resulting in a realistic test placing traditional emphasis on gunnery excellence while providing a tactical vehicle to test the battery's ingenuity and flexibility over a 28-hour period. Now that the test day was at hand, the commander was confident that his battery could handle anything the test team demanded.

The firing batteries had received an administrative and general situation briefing two weeks earlier and learned that there were two test scenarios, with variations, to minimize "G2ing" of requirements. Additionally, representatives from each battery had been administered a Warsaw Pact armor recognition test as part of the ORTT.

While the battery mustered and loaded-out, the commander and key personnel received the final briefing from the S3. By early afternoon, Kingsmen Bravo was headed south toward a tactical assembly area. After the battery was deployed, the test team arrived and issued a frag order for a night move. The team performed a maintenance inspection of unit equipment while questioning soldiers' knowledge of general military subjects. The initial supply of ammunition and rations was issued in the assembly area while the commander moved

his advance party to the first firing position. One howitzer was included with the advance party for use in a high burst (HB) registration prior to the arrival of the main body. The battery survey party was hard pressed to bring control to the firing position and then man the observation posts (OPs) to flash the HB registration which took place while the battery was enroute from the assembly area. After a night occupation, the test continued with an aggressor probe of the battery position and the firing of four interdiction missions.

Early the next morning, activity picked up when Service Battery delivered the Special Ammunition Load and a nuclear fire mission was received by way of radio-teletype. While special weapons personnel began assembly operations, the battery fired conventional missions. Two Chaparral and two Vulcan sections arrived to provide security as the commander made preparations to displace a "hot gun" to meet his nuclear Time-On-Target (TOT). By noon, in addition to an improved conventional munition computation and a timed 6,400-mil mission, the battery had beaten off two aggressor attacks, captured a prisoner of war, survived an aerial biological attack (UH-1 helicopter with M-5 tear gas dispenser) and destroyed an aggressor tank by direct fire. Meanwhile, the commander moved his advance party, hot gun, special weapons convoy



Bravo Battery firing during ORTT.

Right by Piece

and security augmentation forward to a new position to fire the M424 HB registration and prepare for a 1320 hours TOT.

Back in the initial position, the battery minus was computing data for a TOT on a moving target and demonstrating crater analysis techniques using full-scale fiberglass training aids.

While in the nuclear TOT countdown, the commander alerted his battery to displace, and as soon as the "nuc" was on the way and his security elements detached, he moved out with his advance party to set up the new firing position. While battery survey scampered down off the OPs to bring survey control to the new position, the main body was moving on the road when it was hit by aggressor high-performance aircraft (USAF F4s from New Mexico). Dispersing the battery off the road, the executive officer employed his attached Redeye personnel to score a hit on one jet.

The battery completed its occupation while the hot gun, now the base piece, finished a precision fire registration. Throughout the remainder of the afternoon and early evening the firing battery continued to shoot, rejecting an imitative deception fire mission and operating through radio jamming. At 1900 hours, the Kingsmen commander terminated the ORTT and released the battery to return to garrison.

The modified ATT, with its nonstandard inclusions of flexible scenario, air defense, infantry and armor support, airborne CS dispersal, split fire direction requirements, reaction to electronic deception, Warsaw Pact vehicle recognition testing and continual aggressor play was well received. During the critique, where the battery received a combat ready rating, the tested unit was quick to praise the modified ORTT while the test team applauded the flexibility of the format. Next year this format will be further refined making ATT 6-358 an even more realistic test vehicle and a greater challenge to the Kingsmen of the 1st Battalion, 27th Field Artillery.

C Battery Jumps Into Airborne History

FORT BENNING—Jumping into airborne history recently was C Battery, 1-319th (ABN) Field Artillery, 82d Airborne Division. The battery was part of a task force that made the first mass tactical parachute jump using the steerable MC1-1 chute.

Because of its easy maneuverability, the MC1-1 greatly decreases the assembly time of troops on the drop zone. The success of this first mass tactical jump could have a bearing on training at the Airborne School as well as the speed in which airborne units can perform their missions.



The steerable parachute delivers this Redleg of C Battery to designated area.

Besides personnel, C Battery also dropped their howitzers and prime movers before starting their portion of the tactical problem.

4th Div Arty NCOs Get Expanded Training

FORT CARSON—Artillery fire, escape and evasion training and heavy emphasis on leadership are all part of the 4th Division Artillery's "Ironhorse Combat Leaders' Course (Redleg)," designed to qualify junior field artillery enlisted men as small unit leaders. The program, developed in the div arty training office, was initiated due to the shortage of qualified NCOs, particularly in the grades of E5 and E6. As a result, many E4s and E5s were performing duties as howitzer section chiefs with little or no leadership training.

The course is divided into five distinct phases of instruction. First is the five-day Basic Leadership Course which is conducted by the Ironhorse NCO Academy. During this phase, heavy emphasis is placed on leadership principles, physical training and map reading.

Then comes a three-day session at the Signal School where the students work with communication equipment used by the firing battery. Next, four days are spent at the Logistics School to learn maintenance procedures and maintenance management techniques pertaining to artillery equipment. The Recondo School follows with a three-day version of the regular 30-day curriculum. The session begins with an endurance-testing obstacle course, followed by a day and a night compass course over approximately 15 miles. The escape and evasion problem, the next test, is given further meaning by the use of the SERE (survival, evasion, resistance, escape) compound. When students are released, they have some definite ideas to avoid capture. The last item on the Recondo agenda is the live firing of a subcaliber light antitank weapon at a moving tank.

Right by Piece

Finally, there are six days of training in their specialty—field artillery. During this phase, the students receive classroom instruction on the operation of a field artillery battery to include the technical aspects of forward observation, fire direction and firing battery. Following this classroom instruction, the students participate in a two-day practical exercise conducted in a round-robin format. That is, each student rotates from the guns to the FDC to the OP. The first day is executed "by the numbers" at the 14.5-mm trainer range. The following day, the artillery training is put together during a round-robin shoot firing approximately 600 rounds from 155-mm howitzers.

The artillery phase of training was designed to give each student a better all-around understanding of the field artillery as a team regardless of his MOS. Student reaction to this training concept has been positive primarily because it provides an appreciation for problems encountered by other members of the team.

Thus far, 66 students have graduated from the course and reaction from both students and commanders is extremely favorable.

C-5A Galaxy Participates In 2-18th FA Exercise

FORT SILL—Windows rattled and it sounded as if the world were coming to an end when the massive jet landed at Henry Post Field.

However, the C-5A Galaxy, the world's largest airplane, was not at Fort Sill to impress the post; it was here for a very practical mission.

Stretching almost the length of a football field, the massive jet stands as high as a six story building with a cargo compartment as large as an eight lane bowling alley.

In addition to the C-5A, a C-141 Starlifter was included in this Reforger training exercise sponsored by the 2d Battalion, 18th Field Artillery of the 212th Field Artillery Group. Crews and instructors were furnished by the 60th Military Airlift Wing from Travis Air Force Base, CA.

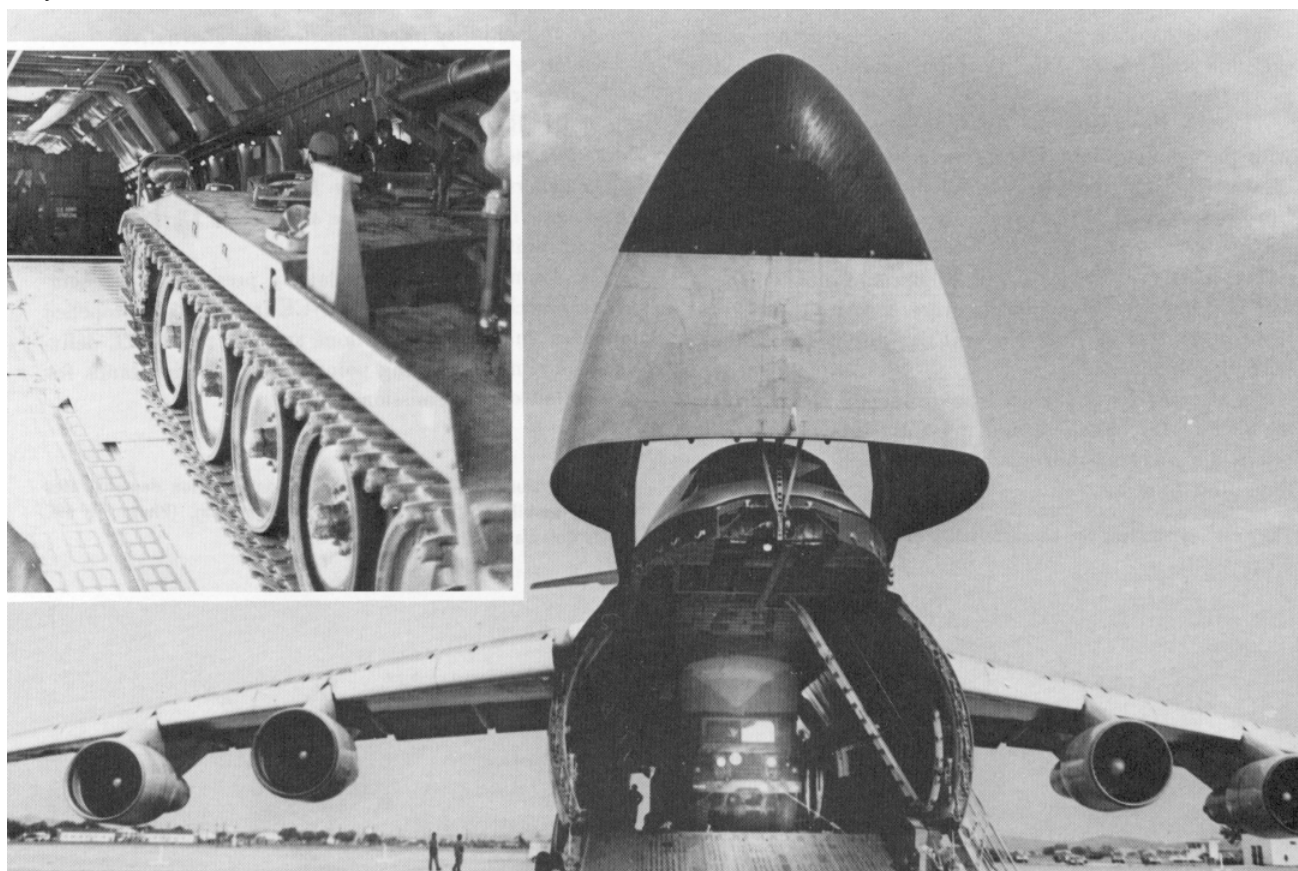
"The battalion must be ready to go anywhere at anytime," stated CPT William Ramsey, battalion operations officer. "We must maintain a high level of readiness and this requires a lot of training."

The exercise focused on two specific activities: planning and loading. The planning seminar was conducted before the arrival of the jets to train battalion officers and NCOs in air loading procedures.

An additional benefit from the planners' course was that participants now have the ability to load different aircraft with varying materiel on any number of sorties.

Selected personnel from each battery attended the loaders'

Members of the 2-18th FA load equipment into massive C-5A Galaxy during Reforger training exercise at Fort Sill. The inset photo shows an 8-inch howitzer rolling aboard.



course which demonstrated how to load and tie down various items of equipment.

"All of the personnel actually loaded and tied down all types of equipment in the battalion. It was a great practical experience," explained Captain Ramsey.

Equipment for the exercise was supplied by the 2-18th and the 3-18th Field Artillery.

Even though the windows were rattled a bit, the men of the 2-18th were trained effectively and will benefit greatly from the experience.

"Cat" More Than Symbol To Unit

FORT RILEY—A big black panther occasionally stands on the mantle at the officers' open mess here. The official mascot of one of the oldest and most decorated artillery units in the Army, the panther was a gift of the Philippine government. It has accompanied men of the 6th Field Artillery and their predecessors for over 70 years. The cat now resides majestically with the 3d Battalion, 6th FA.

The panther is approximately five feet long and weighs 40 pounds. His tail is outstretched with a flick at the end; his mouth is open revealing a flaming red interior and razor sharp fangs; and his coat wears a high-gloss polish.

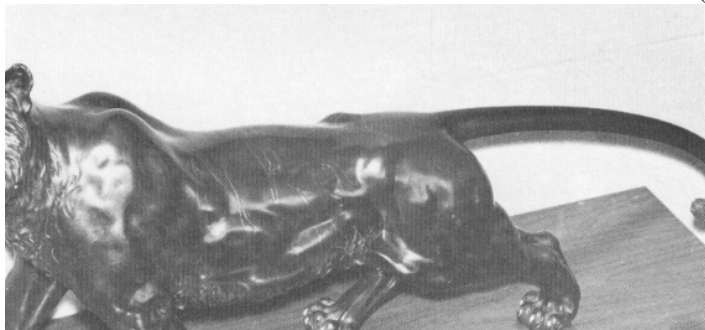
History of the mascot reads, in part, "In 1903 after distinguishing itself in the Philippines during the Philippine Insurrection, the 6th Field Artillery was presented with a token of appreciation by the Philippine government. The panther was a symbol of the ferociousness of the unit combined with its quiet, cunning and swift movements. . . ."

Through the years, the cat found a permanent home with the 3d Battalion. Traditions have been formed, one of which is that the cat is to be displayed at all social functions, formal or informal, attended by the battalion commander.

The lineage of the cat's unit is long and distinguished. The unit has been in combat in every American war since it was organized in 1798. The unit flag displays more than 30 battle streamers.

So, after 70 years, the cat is undisputedly senior to any member of the battalion, and it is probable that he will retain his perpetual baring of fangs and flick of tail for some time to come.

The "cat" symbolizes the characteristics of the 6th Field Artillery.



The "Proud Americans" Claim LANCE First

HANAU, GERMANY — The "Proud Americans" of the 1st Battalion, 32d Field Artillery, are staking their claim of a first for USAREUR and what may be a first for the new LANCE missile system worldwide.

In Early August, C Battery of the 1st turned an assignment to demonstrate the LANCE missile system for the German Army Field Artillery Missile School into an airborne exercise of major proportions.

The airlift involved the transportation of both LANCE tracked vehicles, the self-propelled launcher and loader transporter, as well as the lightweight launcher (LZL, specifically designed for airlift operations) from home station some 430 kilometers to the school near Aachen.

The lift of the nearly nine-ton tracked vehicles was accomplished by four CH-47C model Chinook helicopters. The adopted scheme involved the use of two intertwined 12-foot slings on each of the track's front lifting eyes, and two identically rigged rear 16-foot slings. These slings were caught up with two 3-foot sling "doughnuts" forming the hookup to the aircraft. The air convoy moved at 90 knots.

The LZL was also shipped externally using procedures authorized in TM 55-1425-485-15-1. The launcher was airlifted the entire distance with the training round. Though internal shipment is possible with the LZL, the addition of dual wheels to the configuration in the 1st Battalion for ground stability has eliminated this alternative.

The first day of the two-day demonstration consisted of a dress rehearsal with participating Bundeswehr missile units (Raketenwerfer truck-mounted 36-tube multiple rocket, Honest John, Sergeant). Operations were viewed by members of the current Officers Candidate School class, some of whom are to be assigned to Germany's first LANCE units.

The second day, Charlie Battery presented the assembly and mock launching of LANCE from the self-propelled launcher under field conditions and the aerial LZL delivery to a simulated firing point in front of the stands for a simultaneous fire mission.

Externally slung LANCE missile in LZL configuration demonstrates the air mobile flexibility of the LANCE system. (Photo by SFC James Coleman)





(continued from page 4)

to your father. We hope other readers share our interest in the gun and will continue to respond.—Ed.

A Hit

I'm sorry to say that I've just seen my first issue of **Field Artillery Journal** since it turned pro. Sorry, that is, because it is the first I've seen (May-June 1974), which means I've missed the other(s)? You have a hit periodical on your hands if you maintain the current momentum . . . a thoroughly commendable job, from cover one to cover four.

While I'm not a Redleg, I am a career Army information type with an avid interest in all things communicative. Nothing hurts more than to see a less-than-professional information effort palmed off on the soldier, for whatever the reason and in whatever the medium.

It's great to have *you* on board.

William W. Church
SGM, US Army
Associate Editor

TIPS,
The Army Personnel Magazine

We have published bi-monthly since July of 1973. A limited number of back copies are available for interested agencies.—Ed.

Honoraria

I have two questions. With this letter is my subscription to the **Field Artillery Journal** which will start with the next issue. Is there any way I can pick up back issues?

I have been researching US Army breech loading field artillery weapons and everything associated with them since I was in World War II, and the US Army Ordnance Dept. I have been writing on this subject both professionally for pay and for learned journals for some 10 years. Are you interested in historical articles on US field artillery? Although my interest does not make it essential, can/do you pay for material published in any way? Are there any specific artillery weapons or topics you would like to have covered? If not, I have some very specific ideas which I think might fit your magazine very well.

Thank you very much for your interest and I will be very interested in hearing from you.

Konrad F. Schreier Jr.
Los Angeles, CA

Back issues of the **Journal** may be obtained as indicated in the Editor's Letter of this issue. The staff and, we believe,

all artillerymen have an historical interest in the development of artillery systems. We would like to see some of your work; unfortunately, we are not in a position to provide honoraria for published articles.—Ed.

Military Historians

Having at hand the May-June (1974) issue of your **Field Artillery Journal**, I hasten to comment that it's a most appealing publication and certainly a commendable effort.

I only regret that I've missed the first two issues and wonder if I may purchase them now?

I am certain that this splendid publication would be of considerable interest to The Company of Military Historians. I have notified Mr. Harold Peterson, author of many excellent volumes on military armaments of the past and currently the review editor of the publication, **The Military Collector and Historian**, to look into the possibility of covering the **Journal** in the next issue. No doubt you are familiar with this publication; being subscribed to by the Morris Swett Technical Library.

The current issue of this publication, incidentally, contains an excellent article on the old 3-inch model 1902 field gun.

Perhaps you would enjoy making the **Field Artillery Journal** available to the company membership providing mutual benefits to your operation as well as to the many FA buffs throughout the country.

May God bless your efforts, your families and our Republic.

John Hooper
Collector,
US artillery munitions
Ortonville, MI

Always glad to have article suggestions and new subscriptions. The staff is reviewing the 3-inch gun article. We would be interested in exchanging publications with **The Military Collector and Historian**. A subscription blank has been forwarded to you and back issues are available.—Ed.

BG Ott

Your last issue carried the "Yesterday's Journal, July-August, 1924" article that was, indeed, nostalgic to me. This was something worked out by Lieutenant (later General) Olds, pilot, and me, then communications officer, 11th FA Brigade, Hawaiian Division.

Major Brewer (later Major General) "went easy" on the inadequacy of our radio equipment. Ground-to-ground on the regimental level was non-dependable; ground-to-air practically impossible. "Bob" Olds and I introduced the idea. He and pilot Pitts were amazingly good with wing signals.

This was during the summer of 1923. My son, your present Commandant, was a one-year-old toddler. He has seen electronics and the science of gunnery come a long way!

Edward S. Ott
Brigadier General (Ret), USA
Hammond, LA

Bull Battery

This is to compliment you [Ms. Jackie Snyder, Managing Editor] on the arrangement of the issues that you have worked on since joining the **Field Artillery Journal** staff!

General Ott sent me some courtesy copies along with a Certificate of Contribution. Very nice. (See "Bridgman's Bull Battery," July-August 1974 **Journal**.)

Hope I caused you no trouble regarding the dates on my father. As you noted, it would add interest. Along the same line, Lt. Harry L. Hawthorne who first commanded the "Bull Battery" was the first and only graduate of the Naval Academy to receive the ARMY Medal of Honor—and of all places, at the Battle of Wounded Knee!

Richard K. McMaster
MAJ (Ret)
El Paso, TX

Topics

I am a field artillery major presently assigned as a student at the Naval War College's College of Naval Command and Staff. One of the management course requirements is a term paper on an aspect of management techniques or their application to the decision process in a stress environment.

I would welcome your suggestions on a topic of general or field artillery orientation which might be of interest to your readers. Please advise me if you are, in fact, looking for someone to write on some specific topic . . . I feel that I might be able to "kill two birds with one stone." My rationale is that I may as well write on a subject that someone is interested in reading about.

Robert M. Dunning
MAJ, FA
Naval War College
Newport, RI

The **Journal** is pleased to accept articles on subjects of a general military nature as well as those oriented toward the field artillery. Perhaps an article on naval gun fire support might be appropriate. Your letter brings up an interesting point. We recently forwarded a letter to the Redlegs currently enrolled at Leavenworth encouraging them to forward copies of their student papers to the **Journal**. This invitation, of course, extends to artillerymen attending any of the sister service colleges.—Ed.

(continued from page 58)

Position and Azimuth Determining System designed to provide an all-weather-day-night method of extending survey control; remotely piloted vehicles; sound ranging; and the AN/UMQ-7 Meteorological Data Sound System. This briefing covered current and future target acquisition, position location, meteorological correction and muzzle velocity determination devices and how they provide the capability to deliver effective artillery fire. The lack of first volley effectiveness in 1974 was pointed out and compared to 1983-enhanced capability in the same area. The methodology again used was the CACDA manual war gaming technique.

- Foreign FA systems, an overview of developments and threats: A comparison of foreign and US artillery systems by a representative from the Foreign Science and Technology Center. Analysis included an appreciation of the worth of the threat system in comparison with US Army counterpart.

- Tactical Fire Direction System: Briefing by USAMC on the significant results of Developmental and Operational Test II that have occurred to date.


- FA Cannon and Ammunition Developments: Discussion by USAMC of the developmental status of XM198 (155-mm towed), the XM204 (soft recoil 105-mm) and the M110E2 (extended range eight-inch howitzer system) and associated ammunition. Discussion also included the status of other significant artillery standard and special purpose ammunition developments.

- Cannon Launched Guided Projectile (CLGP): USAFAS/USAMC led the discussion of CLGP system characteristics. This briefing covered the developmental effort and results of the current CLGP firing program. There was also a discussion of the contribution that CLGP could make to the combined arms team of the 1980s.

- LANCE missile system: Briefing by USAMC of the LANCE developmental status included the results of nonnuclear LANCE developmental and operational tests and potential improvements that might be proposed to increase the effectiveness of the LANCE system.

- Pershing IA and Pershing II missile systems: USAMC led the discussion on the development status of the two systems.


- Field artillery priorities: Commandant, USAFAS, reviewed priorities and their contribution in improving the FA capabilities in support of combined arms operations.

The 1974 FASR was the fourth to be conducted at Fort Sill. Other reviews were held in 1969, 1971 and 1972. 

Beyond Deterrence

(continued from page 35)

Field artillery, with the forward defense forces, would deliver both conventional and nuclear munitions. The nuclear dedicated weapons of the force would be one gun per field artillery battery under operational control of the maneuver commanders. It would be deployed in a silent and perhaps hardened position. This deployment scheme can be implemented almost immediately since it requires minimal addition to the tables of organization and equipment, and meets the constraints on manpower and money. The silent gun concept has disadvantages, but its advantages in a limited nuclear environment, where politics dominate both fire and maneuver, are sufficient to warrant its acceptance as doctrine for the European scenarios.

The creditability of our power or policy is measured in part by past reactions to certain threats, our political power, national will and ability to articulate and carry out such power. To deter both tactical nuclear and major conventional war in Europe, we must articulate a policy first which is politically feasible in the US and Western Europe; and second, which is perceived by the East as real. The limited TNW response option, with employment of nuclear weapons by field artillery systems in a forward defensive area, is such a policy. It provides for minimum escalation, deters conventional attacks and can be implemented immediately at minimum cost. 

MAI Ronan I. Ellis, FA, is chief of the Meteorology Division of the Target Acquisition Department, USAFAS, Fort Sill, OK.

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YESTERDAY'S ARTILLERY



Crew Service and Methods of Fire

The men who served the artillery pieces were called "matrosses." It was necessary that the 12 men serving each six-pounder be able to work together since firing was a complicated exercise. An artilleryman would practice many hours not only on his specific job, but also on every job, for battle would often force him to assume the task of a wounded comrade. An expert crew was able to fire 50 rounds in 33 minutes, the most rapid fire safety would permit. After each round the piece would have to be repositioned, using drag ropes and levers. If cannon were to be located in one spot for several days, some type of tracks could be fashioned of tree planks to direct the recoil and aid in repositioning.

At this time there were no precision fire control measures. The most common method was to position the gun to fire directly at the target. This meant that it had to be placed in view of the enemy in the forefront of the battle on ground high enough to command the best field of fire. (Mortars and howitzers would not be included in these generalizations.)

The gun could be masked. At the Battle of Hobkirk's Hill, SC, General Greene used his militia to mask the position of his three 6-pounders until he was ready to use them. Some protection could be gained by placing gabions (bottomless baskets filled with dirt) around the gun and crew, but the piece still had to be swabbed and loaded in front between each shot. Gun emplacements could not be constructed of materials that might shatter and become lethal when hit by incoming rounds.


Generally, the cannon was pointed by taking a visual ray along the uppermost surface of the gun to the target. All crew members were required to visually follow the flight of the shot and comment on it as these comments would serve as a guide for aiming the next shot. During this period, a cannoneer who was a good shot could expect to hit the target on the second or third round. There were devices designed to wedge the barrel into the same place each time, and some guns had turn screws to raise or lower the tube. The barrel could be raised or lowered as much as one-half inch without seriously affecting the accuracy of fire. All the variables in equipment made it unlikely to hit in the same place

twice in succession. These artillerymen were aware of the optical illusions produced as the sun's rays created mirages on a hot battlefield. The general confusion of frontline activities could also throw the aim off as much as 100 yards. At the siege of Yorktown, General Washington required an officer to level every piece by a gunner's quadrant for every shot, but time was not a factor there.

Another method of fire, used primarily against concentrations of men and equipment, was ricochet fire. The cannon barrel would not be elevated above 15 degrees. The ricochet depended on the consistency of ground at the point of first impact. (Soft soil buried the ball and rocky ground caused it to bounce too high.) A solid ball fired in this method could hit people and materiel without being seriously impeded, thus giving the round more chances to inflict damage before it was spent. A shell skipping along with a burning fuze would cause additional fear since no one knew when it would explode. The practice of ricochet fire no doubt developed from the observation that a high shot was lost if it missed its target but a low shot could inflict damage to secondary targets even if the primary object was missed.

Random firing, the third method, did not cause reliable damage. It was developed for targets that could not be engaged by direct fire or were masked by obstacles. Here, both the charge and degree of the barrel had to be increased. Sometimes this type of fire was employed to bolster troop morale, to keep the enemy from perfect safety or to feint an attack.

Team work began before the battle since much energy was needed to get a gun to the battle front. A good crew could pull a piece as far as 300 yards at a run, and there is evidence that the British (as well as the Americans) chose their artillerymen for strength. An infantryman records, "We overtook a small party of the artillery dragging a 12-pounder upon a field carriage sinking halfway to the naves in the sandy soil. They plead hard for some of us to assist them, our officers, however, paid no attention, but pressed forward. . . ."

When the Americans could "put it all together," the artillery performed well. In General Washington's General Order of 29 June 1778, he said, "It is with peculiar pleasure . . . that the Commander in Chief can inform General Knox and the officers of the Artillery that the enemy has done them the justice to acknowledge that no artillery could be better served than ours." 

CPT Lynn L. Sims, FA, USAR, holds a doctorate in history and is a historian at the Command and General Staff College.