



FIELD ARTILLERY JOURNAL

September-October 1977

News and opinions from the field

New binos

Selecting Junior Leaders

Nuclear ARTEP

One Army

Senior Trainers' Conference

Smoke Adjustment

FIST

it's all inside



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FIELD ARTILLERY JOURNAL

Volume 45

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Number 5

The *Field Artillery Journal* is published bimonthly at the US Army Field Artillery School for the same purpose stated in the first *Field Artillery Journal* in 1911:

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

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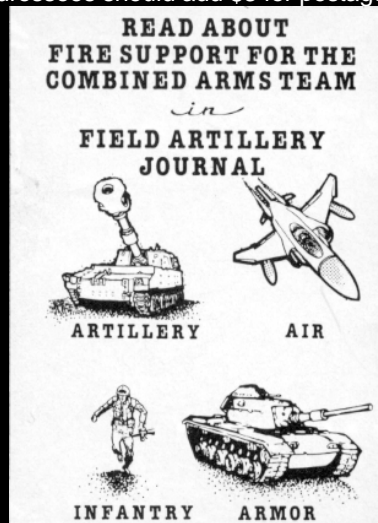
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Articles

- The Conventional/Nuclear ARTEP** 9
*by MAJ Donald K. Griffin and
 CPT Thurman R. Smith*
- Simplified Smoke** 14
by MAJ Michael F. Mitrione
- Do You Really Understand The ARTEP?** 20
by MAJ(P) James L. Noyes
- Getting To The GDP On Time** 23
by CPT Alvin S. Chandler
- Slammer** 30
by CPT R. F. Parker Jr.
- Leadership Talent Search: Private
 To Sergeant** 32
by CPT Jeffrey A. Boucher
- Let's Take Another Look . . . GS
 In The Defense** 40
by MAJ William R. Calhoun Jr.
- Colonial Cannon — South Carolina
 Artillery 1670-1813** 47
by Fitzhugh McMaster
- One-On-One With The Guard** 51
by MAJ Roy E. Korkalo
- Aids To Training — The FA Viewpoint** 54
by LTC L. W. Butler
- AFTCON Report** 57

Features

- Forward Observations** 2
- Incoming** 4
- Right By Piece** 16
- Commander's Update** 22
- View From The Blockhouse** 26
- FA Test & Development** 31
- Redleg Newsletter** 37
- With Our Comrades In Arms** 44
- Redleg Review** 60



page 51



page 16



page 14



page 44



forward observations



by MG Donald R. Keith

The FIST (fire support team) is a reality! On 27 June 1977, the Army Vice Chief of Staff approved the FIST concept. By now major Army commands have received instructions for implementing the FIST concept and the new "shooter's" MOS — 13F.

I want to outline on-going actions to implement FIST. The Close Support Study (CSS), which spawned FIST, was a combined arms effort and the implementation is no different. The combat arms service schools are working together to provide as much assistance as possible to the field units. The formation of FISTs will also be a partnership between maneuver and Field Artillery units. Each FIST member must be proficient in the technical aspects of fire support and must also know maneuver organization and tactics to enable him to provide effective fire support. Here are some milestones for "making it happen."

The personnel in the 13F MOS will initially come from MOSs 13E and 11C who have been working in observer, liaison, and fire support organizations. The Field Artillery School has prepared a training package to aid in the necessary training, and field units should be receiving this packet soon. We are gearing up the training base at Fort Sill to produce the first 13F soldier from AIT in April 1978, shortly after the 1 April 1978 effective date for the MOS. When fully implemented, the 13F MOS will be awarded to about 3,750 soldiers.

Soldier's Manuals for 13F will be distributed to battalion level with other "13-series" manuals this fall. The 13F soldiers will take their Skill Qualification Tests (SQTs) along with other Field Artillery soldiers in April through September of 1978. We are encouraging the administration of the 13F SQT in the last three months of this period to allow more training time for FIST members.

TOE changes necessary to implement FIST will be forwarded to Department of the Army in September 1977. The TOE action will provide enough FISTs, by type, for all supported maneuver units in the division. No longer will the Field Artillery have to field *ad hoc* observer teams to provide observed fire support for the armored cavalry

squadron and the tenth and eleventh maneuver battalions. FISTs and fire support (FS) sections to support these elements will be assigned to general support battalions in all but the airborne and air assault divisions. This departure from traditional FA organization results in fire support for all units who need it and provides observation capability for GS battalions to simplify their training problems.

TC 6-20-10, *The Fire Support Team*, will be distributed early this fall. It provides detailed information on FIST organizations and will outline their employment and communications doctrine. This information will be pertinent to both field artillery and maneuver units.


Work has already started to standardize mortar and Field Artillery observer procedures. Representatives from Fort Sill, Fort Benning, and the 82d Airborne Division met at Fort Bragg earlier this year to work out the details. As a result, TC 6-40-4, *Fire For Effect*, has been revised to reflect the standardized procedures. It will be distributed this fall.

Some aspects of the FIST implementation will not be easy. Of particular note is the stationing problem in Europe, Korea, and our Reserve Component forces. In many cases, the maneuver units are geographically separated some distances from their supporting artillery. Some portions of the FISTs may have to be attached to maneuver units to insure that they have observers for their training.

Another area of concern that has not been resolved yet is the ultimate transportation for the FISTs. The Field Artillery School believes that the best solution for the heavy divisions is a modification of the Improved TOW Vehicle (ITV). This vehicle is an M113 with an articulated arm mounting the TOW tracker so that the vehicle can fire from defilade. The ITV design would allow us to mount the Ground Laser Locator Designator (GLLD) in lieu of the TOW tracker so that designation for Copperhead can be

accomplished from defilade. We also want the vehicle to have the right communications gear efficiently mounted and an inexpensive position navigation system on board. We have just written the ROC and are optimistic that we can integrate our requirements into the ITV procurement program. In the interim we have asked for M113As and we have a simple set of modifications that can be locally accomplished to optimize it for FIST use. For the light divisions we believe that we can leverage off of another TOW-based program. The Infantry wants a more capable vehicle than the jeep for their light battalion TOW vehicle and have tested the XR311 "Dune Buggy." The program for such a vehicle has been approved and we will look at ways to adapt it for our light division FISTs. For now, however, we will have to make do with our 1/4-ton vehicles and trailers.

Many field units have already implemented the concept using current assets — some have had FISTs for more than a year. Others will start to implement now. For all FA units, the message is clear. *Observed fire support is our business!* It is now our responsibility to train *all* of the observers that will adjust indirect fire support for our maneuver branches. The FA Community must realize the impact of this responsibility. More than ever before, we must respond to the observer needs of the maneuver units. This means FIST members with well-honed individual skills and fire support teams that function as teams. Rapport between FISTs and company commanders, always a key ingredient to success in battle, becomes even more critical. This rapport only comes through habitual association and training together.

Fort Sill stands ready to help you in every way possible as we implement this important new concept. We recognize that we are starting with less than optimum equipment and are working to correct that. But we also are firmly convinced that we must move out with what is now authorized to begin reaping the benefits of the Vice Chief's decision. I look forward to watching a steady improvement in observed fire support for our Army. 



letters to the editor

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

Lance computations

Commanders and fire direction computers need no longer dread manual computation of Lance firing data. The introduction of electronic hand held calculators as standard survey equipment and the availability of the Texas Instruments SR-56 in Army supply channels offers a solution to this problem.

The range of the Lance system requires a high degree of accuracy associated with complex mathematical procedures. When the present Fort Sill manual computation form (1432-R (TEST)) was printed in 1972, survey procedures required the use of manual logarithmic and trigonometric mathematics. In addition, several independent entries into the firing tables are required to get firing data using this form. The Lance computer must be proficient in mental math involving two or three place decimals, logarithms, and interpolation. More importantly, he must compute with speed and accuracy under great physical and emotional stress, conditions that a college math major would find difficult. The Lance missile system was conceived with speed, simplicity, and accuracy in mind. Using FADAC, the system can provide timely and accurate data within reaction times that make Lance a formidable weapon. The "Call for Fire" can be processed and computed with firing data in the hands of the Platoon Leader before the launcher is over the launch point. Without FADAC, the firing platoon could be delayed and exposed to enemy fire while awaiting data.

In order to shorten computation time, most computers have resorted to the use of personal electronic calculators. These eliminate "mental math," and depending on the functions available with a particular make and model, logarithm tables can be eliminated as well. Progress in this area can be taken one step further. The manual computation

form can be revised to take advantage of the functions available on the Texas Instruments SR-56. Using the 10 memory locations of the SR-56, intermediate solutions are stored and later recalled in subsequent operations. Logarithms are eliminated, and by converting mils to degrees, entry into trig tables is no longer needed. The resulting data is reliable and accurate. More importantly, computation time for this battalion's average computer has been cut by 50 percent. The firing platoon now receives data when needed, whether FADAC is available or not.

Comparison between the manual and calculator methods illustrates the dramatic time savings achieved with the SR-56 and a revised computation form.

Enclosed are sample forms we created and instructions for their use.

LT Thomas J. Follas is the creator of this system.

George F. Kraus
LTC, FA
2d Bn, 42d FA

Thank you for sharing your ideas for improved Lance data computation. The School has received other similar ideas and the Lance Branch of the Weapons Department is testing a composite of all these systems. On completion of these tests, a change to FM 6-40-4 will be made and forms will be provided to Lance units.
—Ed.

Graphics in error

The "Field Artillery Brigade" article by Colonel Coleman (May-June 1977 **Journal**) was most interesting and informative.

However, some clarification is required; specifically, figures 2 and 3.

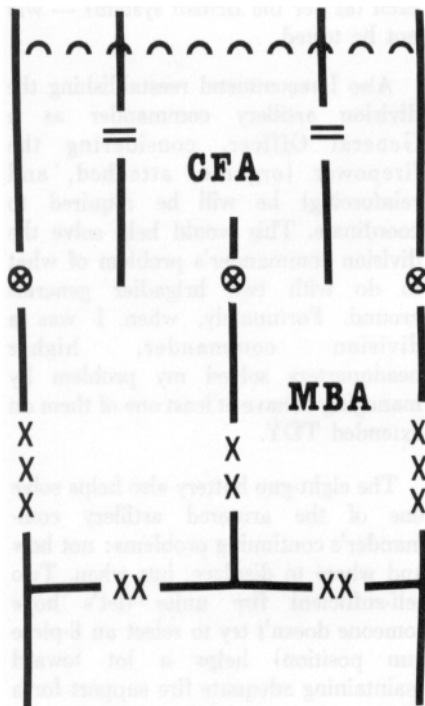
• Figure 2 depicts a corps defensive situation. The covering force area (CFA) is indicated as extending from the division rear boundaries forward to the FEBA — or beyond? Conceptually, it is understood that the CFA extends from the FEBA forward with main defensive positions along the FEBA. As discussed by the author, a covering force might consist of an armored cavalry regiment (reinforced by battalion size task forces provided by brigades in sector). Upon withdrawal of the covering force, battalion task forces occupy their previously prepared defensive positions on the FEBA for decisive engagement of the enemy in the main battle area (MBA).

• Figure 3 also depicts a corps defensive situation — the MBA apparently being defined as extending from the division rear boundaries on to the rear. Conceptually, it is understood that the MBA would begin with the defensive positions along the FEBA and extend to the rear to a specified line which would be defined in the corps/division OPORD. The MBA conceivably could extend to brigade or division rear boundaries. However, that the MBA should be previously defined to a specific area is basic to MBA concept. Otherwise a classical delaying action leading to defeat (considering ratio of combat power) would most likely occur.

The words in the referenced article are clear; perhaps the symbology is new?

Roger B. Ouellette
LTC, FA
Advisor, NHARNG

*The graphics you mention are in error as far as maneuver control is concerned. Not that the maneuver graphics are unimportant, but they were intended to simply provide a frame of reference for discussing FA employment. The symbology we **should** have used is shown here.* —Ed.



Brigade is the answer

The article by COL Edward R. Coleman on the Field Artillery Brigade in the May-June 1977 issue provides a commonsense approach to one of the most important issues for field artillerymen; that is, how to provide firepower for the active defense. "The only good defense is a good offense," makes sense in the face of today's constrained maneuver force resources only if we increase the density of combat firepower at the critical time and place. The division restructure, under test now, provides part of the answer. The FA Brigade provides another part. This is particularly vital for the Reserve and National Guard FA groups.

In World War II, it was not uncommon for one division in offensive operations to be supported by a corps artillery of several FA groups with 20 or more FA battalions. Even with the increased accuracy, range, lethality, and target acquisition capabilities of today's field artillery, it may not be unrealistic to suppose that modern battlefield attrition of our forces may require a similar fire support density in future combat. Our Reserve and National Guard FA groups are the source for the needed reinforcement of our div arties. They must

be ready. Colonel Coleman's article gives them a starting point to achieve that readiness.

Winn B. McDougal
MAJ, FA
Fort Sill, OK

Who should train our leaders?

CPT R. H. Kimball's letter (March-April 1977), "Training Our Leaders," points out a basic contradiction between different elements of TRADOC which few people, apparently, understand (based on Editor's reply to Captain Kimball).

Because of the nature of today's ROTC mission, cadets are not getting the leadership training needed to develop those attributes required of an Army officer. The problem lies in the fact that in recent years ROTC emphasis has been shifted to attracting new cadets with a concomitant deemphasis on the officer preparation of cadets. "Don't worry about that — they'll get the training at OBC." From approximately 6,500 ROTC graduates in 1976, we have been challenged with the goal of producing 10,000 graduates in 1980.

ROTC cadres are spending a larger portion of time on recruiting than on training activities. This is naturally to the detriment of the preparation of those cadets in the program.

Also, the Editor is in error when he points out that there are "four years to do it." There are a number of optional programs which reduce the time span. Some schools use "Module Programs" (adventure training) and course compression with the result that many cadets finish ROTC in two years or less. This is obviously not enough time for the cadet to receive extensive leadership training. He does not get enough to immediately function as an officer with the required degree of confidence.

So where does this leave us? The officer basic and advanced courses, along with many Army institutions, have had budget cuts which result in instruction being mainly in branch-related areas with a reduction in many important areas, such as leadership training. At the same time, ROTC units are being pushed for increased enrollments with the consequent loss of

valuable hours which should be devoted to training of cadets.

Frankly, I don't know where that will leave us in the event of war, but many officers feel that the quality of leadership training is not what it should be. The principle of "make do with less" hardly seems applicable in this case. Our Army has a proud tradition of victory in battle — this has not been solely because of the quantity of its equipment but largely because of the QUALITY OF ITS LEADERSHIP.

James F. Lawton
CPT, FA
Florida State University Army
ROTC

Safe TRC-80 operation

The picture of the AN/TRC-80B in the FA Journal May-June issue causes me some concern. I am unable to believe that a section chief can let any member of a microwave section start the engine generator and erect the antenna without first grounding the shelter. Even the door of the power and signal entry panel where the ground binding post is located was left closed. Grounding the components inside the shelter to a common ground is a must. It protects the equipment from damage and the operator from being killed.

The fresh air vent on the shelter door is closed. If the vent is left closed, proper ventilation is not established and the air conditioners might be damaged.

Trees or obstacles in front of the antenna beam are a NO-NO. The antenna must be sited high enough above the ground to provide a clearance of five meters above any ground obstructions for a minimum distance of eight kilometers in front of the antenna to avoid ground reflections or loss in signal.

I wonder if the picture was taken with the beam switch in the "on" position. Standing on either side or at the rear of the antenna while the beam is on is potentially hazardous. A recent study conducted by the U.S. Environmental Hygiene Agency on the AN/TRC-80B revealed that potentially hazardous levels of radiation were encountered from various areas of the system. Transmission was detected from the back of several antennas, possibly due to antenna damage.

Incoming

Please accept the above comments as constructive. They are in the best interest of safe operation and correct employment of the radio terminal set.

Luis F. Hernandez
TRC-80B Instructor
Field Artillery School
Fort Sill, OK

Counterfire and other D/A missions

For the past year I have watched with considerable reservation what appears to be an oversell of the counterfire function at the div arty level. Much of today's literature concerned with fire support operations infers that the only fires for which a div arty is proponent are direct support (close support) and counterfires. This is misleading to young field artillerymen. In my experience and still continuing, there are numerous other types of FA fires required of a div arty.

This letter is not intended to "shoot down" counterfire but is an attempt to illuminate some of the other needs a division has for FA support and to place counterfire in its proper perspective in overall division actions.

The combat mission of any div arty breaks out into two major efforts. These are defined in Appendix B, paragraph B-3, of the approved draft for the new FM 6-20 as:

- A div arty provides FA fires as needed throughout the division. These include the needs for direct and general support fires and reinforcing fires. To manage this effort a div arty tactical operations center (TOC) is formed. To acquire targets for this support, the TOC manages the target acquisition battery's activities and uses air observers.

- The div arty provides one or more fire support elements (FSEs) at the division command posts (main and tactical). These FSEs are concerned with overall fire support used on surface targets. The FA fires planned and executed by the div arty TOC are but one part of this overall division effort. While the TOC looks at FA support alone, the FSE is concerned with the "big picture" — division fire support collectively.

In combat operations, the div arty provides combat support in a manner determined as most effective by the

division commander. In one combat action, his greatest need may be counterfire. The next action may call for FA fires to concentrate on suppressing enemy gunners and observers. A third action might call on the FA to "close off" the immediate battle area to the enemy's second echelon forces. Even within a single action, priorities on FA fires may change abruptly. The div arty must have flexibility to meet changing demands and emphasis. The div arty cannot be "locked in" on counterfire at the expense of all other fires.

It is recognized that today's div arty TOC does have a greater capability to acquire targets and increased assets to meet the counterfire challenge; however, it continues to have responsibility for other types of FA fires. These include preparations, counterpreparations, harassing and interdiction programs, smoke and illumination fires, suppression fires, defensive fires, and other types common to general support and reinforcing elements. Frequently, the TOC is engrossed with these fires and not with counterfire. No one type of FA fire dominates the scene.

Today's young field artillerymen should not "lose sight of the forest for the trees." New names for facilities and duty positions have not altered div arty's proponentcies that much. Div arty continues to do what it is best equipped for — provide responsive FA fires of all types and coordinate fire support for the division commander.

Charles W. Montgomery
LTC (Ret) FA
Lawton, OK

Rank recommended

I enjoyed reading General Keith's "Forward Observations" on the Division Restructure Study in the May-June **Journal**.

I was particularly pleased to note that my recommendations — that an armored (SP) field artillery battery consist of two "troops" of four guns each, which I made to the European Theater General Board in fall of 1945 and subsequently reiterated to CONARC after tests in 1955 at Fort Hood — are about to be tested.

I fear that my other recommendation — that the battery be commanded by a major and the "troops" by a captain

each (as per the British system) — will not be tested.

Also I recommend reestablishing the division artillery commander as a General Officer, considering the firepower (organic, attached, and reinforcing) he will be required to coordinate. This would help solve the division commander's problem of what to do with two brigadier generals around. Fortunately, when I was a division commander, higher headquarters solved my problem by managing to have at least one of them on extended TDY.

The eight-gun battery also helps solve one of the armored artillery commander's continuing problems: not how and where to displace, but when. Two self-sufficient fire units (let's hope someone doesn't try to select an 8-piece gun position) helps a lot toward maintaining adequate fire support for a fast-moving armored formation.

George Ruhlen
MG (Ret), USA
San Antonio, TX

Survey for Lance

In response to SSG Phillip M. Stevenson's letter to the Editor, May-June 1977 Journal, I would like to offer an alternate method for laying out the Lance firing point. The 1st Bn (Lance), 12th FA, is currently designing its firing points in the shape of a triangle. Once the firing point has been determined, the back-azimuth from the general azimuth of fire is computed. The orienting station (OS) is placed on this line 35 to 70 meters behind the firing point. The end of the orienting line (EOL) is placed on the left side of the OS. The only significant requirement for the EOL is that it be 35 to 70 meters from both the OS and the firing point. If a major shift in the direction of fire is required, which has occurred during our battalion tests, the three points (OS, EOL, and firing point) may be transposed to keep the missile within sighting and laying limits. This concept will allow firing throughout 6400 mils if necessary.

I foresee the number of artillery surveyors in Lance units being greatly reduced when a system similar to PADS (Positioning and Azimuth Determining System) and the SIAGL Gyro are fielded. The survey personnel could then

be dropped from the TOE, or replaced by Lance missile crewmen to man six additional self-propelled launchers, thereby doubling the Lance battalion's firepower with minimal personnel cost.

Alan L. Moore Jr.
MAJ, FA
1st Bn, 12th FA
Fort Sill, OK

Shoot, move, communicate, and PROTECT!

One lesson for artillerymen, reinforced during the Vietnam War, is the necessity to protect crews and howitzers from indirect fire. However, this lesson learned and relearned in every war is not taught or practiced by most artillery units today. When defensive measures are questioned, leaders of artillery units respond by producing a "security overlay" which only provides information on locations of crew-served weapons, fields of fire, and perhaps a few foxholes.

When battery leaders are asked what measures they have taken or plan to take to protect their crews and howitzers from hostile fire, they reply that in war they would have many foxholes and bunker complexes. Light artillery units will add that they would build a wall of sandbags around their howitzer positions. Few of these leaders will know the whereabouts of the sandbags or how to construct a wall around a howitzer.

It is a matter of life and death or defeat and victory, that field artillerymen include in their training program a defensive plan for protection of crews and howitzers from hostile fire. New and better radars will soon be on the battlefield, seriously threatening the survivability of FA units.

An artillery unit's ability to survive is as important in its training mission as its ability to provide accurate and timely fires.

What should a battery defensive plan add to its normal security arrangements to protect its howitzers and crews from hostile fire? In the case of light artillery, it may only be necessary to continue the Vietnam practice of building a wall of sandbags and bunker complexes.

However, self-propelled (SP) artillery, with its nuclear capability, will require much greater protection because it will be the primary artillery weapon in a conventional war.

SP weapons expose a large surface area to hostile munitions. The crew in the compartment of the medium howitzer (M109) will not be protected from exploding munitions.

One method of protecting SP howitzers is an adaptation of the basic foxhole. This adaptation must accommodate the large SP howitzer and facilitate its firing movement. It may not always be necessary to construct these depressions as they may occur naturally. In 1970, I found adequate natural depressions at Fort Carson, CO, and used them to protect and conceal an entire medium artillery battery. One depression contained enough "fingers" to emplace all howitzers, and careful positioning allowed a direct fire capability for each weapon.

Natural depressions may not always be available, and depressions will have to be man-made. In 1975 at Fort Hood, TX, I requested a bulldozer be attached to my heavy battery. The bulldozer was employed in an experiment to evaluate the occupation of man-made depressions.

In the initial stages of the experiment, the bulldozer was employed with the advance part. The first sergeant and I personally selected and supervised the digging of all depressions. Positions were selected that provided displacement, camouflage, and excellent fields of fire. Gun guides obtained readings from the aiming circle. The bulldozer operator was then directed to construct a depression along the axis of stakes placed by gun guides.

Each depression required 10 to 15 minutes to excavate. If the bulldozer struck a rock bed, we found another position. The depression was dug so that the howitzer could back in. Ammunition space was not provided in the depression. Ammunition pits were protected by other means to the rear of the pieces.

After the depressions were made, they were evaluated for their ability to support the spades, provide for turret movement, and, most important, trafficability. In the event of a

movement order or a flash flood, howitzers must be able to withdraw rapidly from a depression.

There were no noticeable delays in the occupation of man-made depressions. Two aiming circles were required to lay the battery; however, this is not unusual in any occupation. After the battery was laid in a new location, the bulldozer filled in depressions no longer required.

Several advantages besides protection of the crew and howitzers became apparent. The time required to emplace camouflage nets was significantly reduced because of the small exposed low profile that remained. Crew members became enthusiastic in adding additional camouflage to their sections. Often, it became necessary to mark the battery position by smoke to assist helicopter pilots in locating us.

The man-made depression experiment was tested during an ARTEP, and the results demonstrated that the extra time and effort to construct depressions did not affect timely and accurate fires. The "bulldozer battery" had the best time and accuracy records of the battalion. This experiment illustrates one method an artillery battery can use to protect howitzers and crews from hostile fire and enhance unit camouflage efforts.

Presently there is no precise research data to support the effectiveness of the depression occupation technique. A test should be conducted to determine the feasibility of placing a bulldozer in each medium or heavy battery. In a conventional war, survivability of the field artillery will determine the victor. Techniques must be developed now to prevent the early destruction of the nuclear arm of the Army — its medium and heavy artillery battalions.

Robert H. Kimball
CPT, FA
Houston, TX

What next?

We have had roving XO posts, roving FOs, roving guns, and roving names for our annual unit tests. Undoubtedly a roving BOC is next

Robert A. Strong
CPT, FA
Fort Sill, OK

Incoming

Keep tanker nets

MAJ Ed Smith's article on C2S2 (July-August 1977 Journal) capsulized everything wrong with battlefield communications today. The changes he and his group proposed should be endorsed by every "battle captain" of all ranks. Acceptance of these changes may well be the key to survival on the next battlefield. Major Smith is obviously possessed of keen insight and intellectual breadth (since he agrees with me); however, I take issue with the idea of eliminating tank platoon radio nets.

As the article pointed out, "because of the overuse of discreet frequencies at the higher levels of command, where alternatives to FM radio exist," the lower echelons (platoon, troop, company) must share their frequencies with other units. For example, as a troop commander on REFORGER 76, I "shared" my command net with other units every day, compounding my command and control problems immensely. The same was true for each of my platoons. As Major Smith points out, "these lower levels are where the clear FM sets are essential." I agree. Why, then, delete the tank platoon net?

Some will answer that a tank platoon leader can effectively control his elements with hand and arm signals, flags, etc. In some cases, yes, he can. But think of the modern battlefield, the numbers of enemy, and the immediacy of each engagement. In Europe, because of the terrain and large frontages, the platoon leader probably can't deploy effectively and still maintain visual contact with his vehicles. Then, when the shooting starts, and our tanks are buttoned-up, who has time to watch the platoon leader? Each tank is involved in a moment-to-moment battle of survival. To delete the radio net reduces the mobility and, thus, the effectiveness of armor. We are not "52-ton pill boxes." We must retain the capability of moving great distances quickly, and one can't do that without a radio net.

A second argument states that all tanks are on the company attack net. If, as a company commander, I control all 17 tanks on my command net, why do I need platoon leaders? My control problems are compounded, and platoon distribution of fires is impossible. And what of armored cavalry? Can 27

vehicles performing three different functions (M551 Sheridans, scouts and mortars) be controlled on one attack net?

I am confident that senior armor officers agree that the tank platoon net could be deleted. But how many junior armor officers agree? I would much rather have the division chaplain use the telephone and give his frequency to some struggling "battle captain" trying to fight with his platoon of tanks.

James A. Ward, Jr.
CPT, AR
Tallahassee, FL

Thanks for the favorable comments regarding C2S2. In response to your criticism of the recommendation to delete tank platoon nets, this was one example of the need to examine the necessity of all nets. The study group recommended deletion of the tank platoon net (among others) and not the radio. The radios would remain in each tank, and, in those situations you outlined where the use of radio was the only alternative, the tank platoon leader could use the company alternate net to control his tanks. The study group did not mention, or even suggest, deletion of the armored cavalry platoon net. There is simply too much going on in a widely dispersed area to make this workable. Surprisingly enough, many junior Armor officers did agree with the proposal to delete tank platoon nets. Sorry you were missed in the survey. —Ed.

C-94 is great

As a former "Redleg" in C Battery, 94th FA, in Berlin, I'd like to congratulate Robert Thompson on his story entitled "Outpost of Democracy" (May-June 77 Journal) which tells it like it is. C Battery, 94th FA, is the most outstanding battery I've been in or heard of. I served 14 months under Captain Thompson and, being under an infantry battalion, things got pretty hectic at times. When my enlistment was up, I got out and am now a civilian assigned to a National Guard unit.

Jimmy Leigh
Lebanon, KY

EIR system

HELP!! One of the Army's better ideas, the Equipment Improvement Recommendation (EIR) System, isn't working. Each equipment failure or problem should be reported by submission of an EIR (DA Form 2407). This is not being done in many cases. As a consequence, many problems with Army equipment are not being surfaced to the level where something can be done.

If you are a driver or mechanic, you can help. Ask your supervisor to explain the EIR System and then use it. Also, don't be discouraged if it takes time for a problem to be solved after you submit your EIR. Most problem solutions will require time for engineering and field testing.

Supervisors and commanders can help by emphasizing the program. If you are a little vague on the details, see TM 38-750.

Also, the technical bulletins (TB 43-0001-series) which contain field fixes are not reaching the unit and mechanic levels.

This is a list of technical bulletins (also called EIR Digests) which contain field fixes on materiel frequently found in FA units. They are published quarterly and can be obtained by submitting DA Form 12-34A for pinpoint distribution.

- TB 43-0001-2 Rotary Wing Aircraft
- 6 COMSEC
- 9 Electronic Command
- 20 Redeye Missile System
- 22 Land Combat
- Support System
- 23 Pershing System
- 25 Sergeant System
- 27 Lance System
- 32 Calibration
- 35 Nuclear Weapons
- Materiel
- 36 Armament Command
- 39 Tank-Automotive
- Equipment
- 40 Commercial Automotive
- Equipment
- 42 Materiel Handling
- Equipment

James E. Dawkins
CW4, USA
Fort Sill, OK

The Conventional/Nuclear ARTEP

The 1st Battalion, 27th Field Artillery, was one of six units worldwide used in the validation of the TRADOC concept "ARTEP for Nuclear Units." The concept proposes to incorporate realistic nuclear training objectives based on FM 100-50 into the ARTEP for cannon units. If approved, noncustodial units would be trained and evaluated against their total TOE mission combat capability solely by means of the ARTEP. For units evaluated under ARTEP, administrative aspects of the Nuclear Surety Program (Program Review Panel, publications, records, and reports) would be examined at no lower than installation or division level. This evaluation should not be confused with the old ORTT/TPI exercise, in which the unrealistic TPI was performed under field conditions. —Ed.

Something new is here! For many, the joint ARTEP and nuclear weapons exercise is an experience yet to be enjoyed. Recently this concept was tried with several field artillery battalions, including the 1st Bn, 27th FA, at Fort Carson, CO. The evaluation of this 8-inch howitzer battalion was observed by representatives from DA, FORSCOM, and Fort Sill to validate ARTEP 6-165 (N) as a training/evaluation vehicle. This article expresses some ideas formulated through the experience of members of the evaluated unit.

Others have spoken out on the realistic training value of a combined nuclear and conventional ARTEP as opposed to a Nuclear Surety Inspection (NSI). (For example, see the letter from MAJ C. F. O'Donnell in the March-April *Field Artillery Journal*.) The NSI by itself concentrates on assembly operations and security and transportation requirements primarily relevant to noncombat operations (depending on the degree to which the concepts of FM 100-50 are integrated). On the other hand, the ARTEP primarily (and very effectively) stresses conventional operations. The two combined present a "worst case" combat operations environment where command functions

and tactical and logistical performance can be evaluated profitably. Properly administered, ARTEP 6-165(N) is a total concept, stretching all the muscles of a battalion in an "as-we-will-fight" environment.

There are some serious problems when a unit first attempts to conduct nuclear and conventional operations simultaneously. Key personnel (BCs, XOs, FDC personnel, etc.) who had been performing nuclear related tasks simply are not available in a conventional combat situation. Service battery, which is hard pressed to deliver the conventional ammunition, is unable to handle its combined conventional and nuclear mission. There is a tendency to structure the scenario so that nuclear operations are lumped together "to get 'em over with." This article will concentrate on the tremendous training value which can be realized by an artillery battalion planning for and practicing the conduct of conventional fires and nuclear fires concurrently.

A Nuclear ARTEP Scenario

One plausible scenario is a defensive situation which, although the planned lines of withdrawal of a detailed operations plan (OPLAN) may be used, is deteriorating to the point that nuclear weapons are required. A series of position areas may have been designated in advance. Nuclear subpackages may have been proposed and be pending approval. Control by higher headquarters after the initial hours frequently may be interrupted, requiring increased reliance on an OPLAN and unit initiative. Confronted with rapid enemy moves, intensive artillery, and airstrikes, hasty moves are the order of the day. Units run a high risk of becoming isolated or cut off. As the level of combat increases, the need for conventional fires increases. Jamming and interference of radios restrict active command and control. Against a background of maximum conventional activities and mounting confusion, command and control of the prescribed nuclear load (PNL) and delivery units to place the proper yields at the proper time and place is the paramount consideration for survival. That management, which is never tested by an NSI, represents the single most valuable training experience of the nuclear ARTEP.

A scenario of three or four moves (all hasty, and at least one at night) through a planned series of positions can be

tailored within a 36- to 48-hour period. The defensive OPLAN might include three contingency nuclear subpackages of 4 to 10 targets each, prescribing a nuclear load of 15 to 20 rounds. A detailed target analysis for at least one subpackage might require specific widespread nuclear firing positions, thereby constraining unit freedom of action. The scenario should have several "overload" points where the battalion is totally taxed. A conventional ammunition supply and a nuclear issue at a special ammunition supply point (SASP) concurrent with a battalion move could be included. For an 8-inch battalion, all six assembly teams might be forced to assemble simultaneously. Nuclear fires immediately preceding a conventional preparation are demanding. Conventional fires must be required continually to avoid a sequential ORTT/TPI effect.

Problem Constraints

The introduction of nuclear operations into an ARTEP (or combat) imposes constraints that complicate planning in a refreshing way. One constraint, which a unit may wish to impose upon itself, is to fire nuclear rounds only from positions not previously used.

Firing from carefully occupied "hide" positions, which contain minimum vehicles and from which neither artillery fire nor radio transmissions have emanated, is an obvious plus for survivability. The tradeoffs are some loss of conventional fires, additional movement on the battlefield, more complex operations, increased wire communications and a more complicated survey problem.

Units may also choose to avoid spotter round registration with their tell-tale sign. There is no doubt that the enemy can gain key information from a high explosive spotter (HES) registration: It implies the intent to use nuclear weapons, identifies the caliber of the firing unit, and exposes the firing unit to possible location by the enemy. The net result may well be an enemy preemptory nuclear or chemical strike or massive conventional counterpreparation. Additionally, an HES registration may provide sufficient warning to enemy personnel to allow them to harden their positions and possibly degrade the effects of the nuclear weapons. This is not to imply that the HES registration is without value — it is a viable fire direction technique, especially when accurate survey or meteorological data are not available. The HES registration may also have tactical value as a sign to show the enemy our intent to use nuclear weapons and hopefully convince the enemy to cease and desist or suffer the consequences.

SOPs, perhaps at division artillery level, should give guidance on the minimum acceptable percentage of tubes to be devoted to conventional fires during nuclear operations. It is difficult to imagine a situation requiring nuclear fires that would not also put a premium on conventional support for ground forces. We must recognize

that we will be required to provide maximum close support while preparing for the nuclear package delivery.

The time intervals in the nuclear sequence of events (i.e., permissive action link (PAL) release, weapon assembly, transportation to delivery unit, target refinement, and prefire) are critical constraints on how a battalion operates. With nuclear rounds still in a central area 2 to 3 hours before the beginning of a nuclear time span and a PAL release not yet received, some very critical decisions must be made.

Guard requirements for nuclear weapons come out of the unit's hide. For a 2- to 3-day scenario with nuclear weapons, the unit can afford to deplete S1, S4, and maintenance personnel. Resources within a firing battery, being heavily committed to conventional operations, are scarce.

Operations security requirements demand that the unit make every effort not to look like a unit with nuclear weapons, a consideration which must be supported in SOPs and in unit operations.

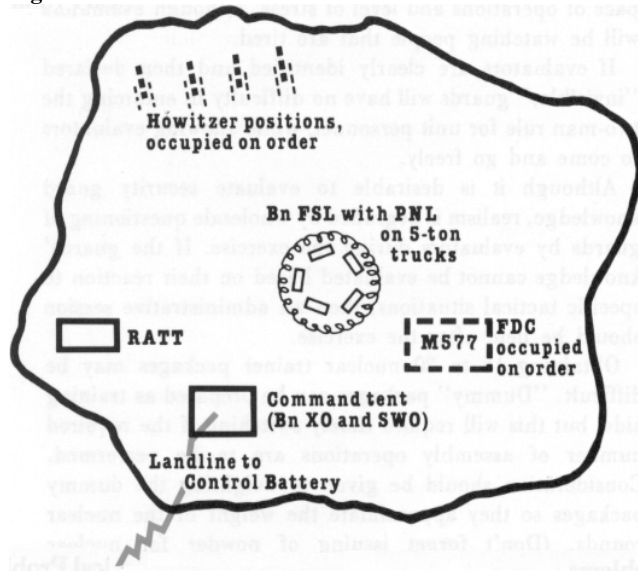
Two Approaches

Within the constraints mentioned, there are a multitude of viable modes of operation. A natural approach in line with the doctrine implied by modification tables of organization and equipment is to make the PNL an integral part of each firing battery, requiring the firing battery to secure, transport, assemble, and ultimately fire a portion of the battalion PNL. This solution provides maximum responsiveness since the nuclear weapons travel with the delivery means. The dispersal of the PNL to three firing batteries reduces the chance of losing all nuclear rounds to enemy action. The firing battery nuclear weapons personnel can assemble and prefire on site. This approach appears to have a great deal of flexibility.

From the standpoint of enemy detection, a firing battery is a dangerous place to be. During a deteriorating defensive operation, the heavy volume of conventional fires, radio communications, and frequent moves spell exposure. The battery is lean, totally committed, and less than a bastion of defense for nuclear weapons.

How will a firing battery with limited personnel, already committed to accomplishing the conventional mission, secure a PNL of up to 15 rounds? The battery is primarily concerned with surviving on the battlefield, maintaining a continuous conventional capability, manning a perimeter, and preparing future positions. The added concern for nuclear weapons and the constant "out-of-your-hide" security requirements covered degrade the battery's conventional capability. Clearly there are security and operational advantages to be gained by minimizing the time that a battery must shepherd nuclear weapons. This line of reasoning favors keeping the entire battalion PNL in

Figure 1.



Nuclear Satellite

one location — a nuclear satellite (figure 1). The temptation is for immediate rejection of that idea based on the "all your eggs in one basket" rule. But, if that basket were a very safe place and we could retain flexibility and responsiveness, this might be better than having the nuclear weapons in the three high-risk firing battery areas.

Nuclear Satellite

A safe place for a nuclear satellite would be a well-concealed storage area away from howitzer firing, without radio transmissions, and with adequate mobility and sufficient personnel for security. We tried to achieve this configuration by:

- Colocating headquarters and service batteries (less battalion maintenance which was located in a trains area). The PNL was part of this complex, forming a battalion nuclear weapons satellite.
- Attaching the battalion tactical operation center (TOC)/fire direction center (FDC) to a firing battery (the "control battery"). Selection of a control battery (figure 2) may change based on the tactical situation.
- Maintaining secure radio listening silence (including a radio teletypewriter (RATT)) within the nuclear satellite.
- Locating the nuclear satellite 2 to 3 kilometers from the control battery.
- Laying wire between the nuclear satellite and the control battery.

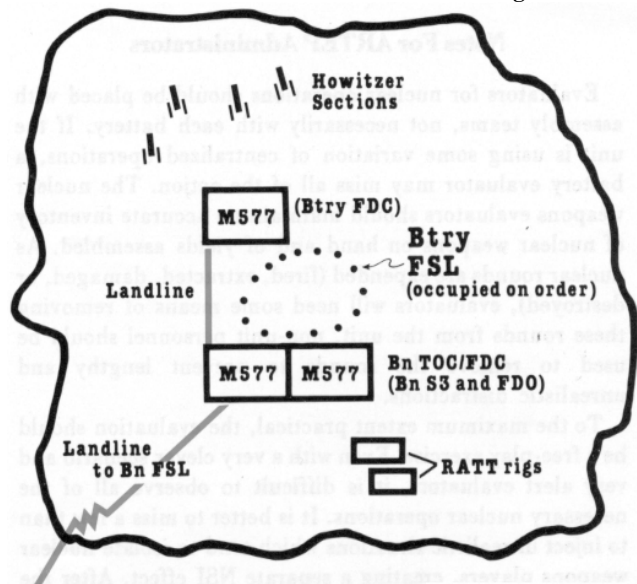
Our nuclear satellite was controlled by the battalion executive officer. The headquarters and headquarters battery (HHB) commander was responsible for position security, and the service battery commander (the battalion special weapons (SW) officer) provided for internal nuclear weapons security and operations. On an as-needed basis, assembly crews and vans from firing batteries

traveled with the satellite. To the extent possible, normal S1 and S4 activities continued in this area while these personnel augmented the nuclear weapons guard forces.

With a safe storage location established, attention turned to the management problem of providing the correct weapon yield on time to a firing unit. The nuclear subpackage concept is a great aid to planning. Once the PAL release is received, the satellite can build an optimal selection of yields, thus providing the unit the capability of firing any subpackage as well as providing backup rounds. The flexibility of having additional rounds of various yields available is particularly helpful when the target analyst changes a yield at the last minute.

With the nuclear weapons in a consolidated field storage location (FSL), the unit will eventually face transporting the rounds to a firing site. This movement, by ground or air convoy, will increase the vulnerability of the weapons at a crucial time; the defensive situation is deteriorating rapidly, and the weapons will be placed on the road where they are subject to ambush, airstrikes, or indirect fire. This also increases the possibility of missing or delaying a time-on-target in case a load carrier becomes inoperable, requiring a time-consuming transload. One method of circumventing this problem is to move the *guns* to the *rounds*, thus reducing the vulnerability of the rounds. The battalion consolidated FSL has been in a silent status (both firing and radio) and has had sometime to harden their position. If survey is carried to this location, the FSL can be used as the firing site. This obviously requires close coordination between the analyst and the battalion, but

Figure 2.



Control Battery

provides a safe and secure environment for the rounds. It may not be possible to engage all targets from one location, but this technique should be considered.

If possible, it is wiser to move howitzers to nuclear weapons rather than vice versa. It may be possible to fire an entire subpackage from two howitzers that have been moved into the previously surveyed satellite position. An FDC need not be sent, since firing data are available by wire from the control battery (there are two FDCs at that location). If the battalion habitually delivers a time-of-fire volley from *all* firing locations in conjunction with each nuclear round, most of the security of firing nuclear rounds from multiple positions is retained.

The flexibility of the satellite system is limited only by imagination. Any number of guns can be moved to the satellite. Remaining guns may be cross-attached among batteries to maintain a reasonable conventional capability. Whenever possible, only guns from one battery should be involved in the nuclear missions, thereby minimizing the impact on conventional fires. With all nuclear weapons being fired from one location, communications and control are facilitated.

On occasion, a detailed target analysis may require that nuclear weapons be fired from specified locations. If the satellite cannot conveniently occupy the specified position (or if there are multiple positions), then nuclear convoys will be required. One solution is to split the guns of one battery and send an assembly van, assemblers, and nuclear weapons (including backups) to each position. Units must be prepared to use NCOs as courier officers — NCOs because you soon run out of officers. Target analysts must appreciate the risks associated with this type operation and make timely decisions.

Notes For ARTEP Administrators

Evaluators for nuclear operations should be placed with assembly teams, not necessarily with each battery. If the unit is using some variation of centralized operations, a battery evaluator may miss all of the action. The nuclear weapons evaluators should maintain an accurate inventory of nuclear weapons on hand and of yields assembled. As nuclear rounds are expended (fired, extracted, damaged, or destroyed), evaluators will need some means of removing these rounds from the unit, non-unit personnel should be used to remove the rounds to prevent lengthy and unrealistic distractions.

To the maximum extent practical, the evaluation should be a free-play exercise. Even with a very clever scenario and very alert evaluators, it is difficult to observe all of the necessary nuclear operations. It is better to miss a few than to inject unrealistic situations which tend to isolate nuclear weapons players, creating a separate NSI effect. After the evaluation, if genuinely concerned over a particular operation, evaluators may

wish to hold administrative sessions. These really will have little impact on the ARTEP pace of operations and level of stress, although evaluators will be watching people that are tired.

If evaluators are clearly identified and then declared "invisible," guards will have no difficulty in enforcing the two-man rule for unit personnel, while allowing evaluators to come and go freely.

Although it is desirable to evaluate security guard knowledge, realism is degraded by wholesale questioning of guards by evaluators during the exercise. If the guards' knowledge cannot be evaluated based on their reaction to specific tactical situations, then an administrative session should be held after the exercise.

Obtaining 15 to 20 nuclear trainer packages may be difficult. "Dummy" packages can be prepared as training aids, but this will require timely switching if the required number of assembly operations are to be performed. Consideration should be given to weighting the dummy packages so they approximate the weight of the nuclear rounds. (Don't forget issuing of powder for nuclear rounds.)

Practical Problems

Artillery units are hard pressed to transport their conventional basic load; add a reasonable PNL, and the problem is aggravated. It is difficult to "play" this problem in the ARTEP simply because sufficient conventional ammunition is not normally available. We found that the maximum number of nuclear rounds that we could carry was six for each 5-ton truck. A PNL of 15 rounds would require a minimum of four 5-ton trucks (all with proper tie-down kits) — three as load carriers and one as a backup. Loading a PNL of 15 to 20 rounds into three or four trucks requires several hours' labor. If the required tie-down procedures are followed precisely, more than 100 cargo straps are needed, increasing load time considerably. Carrying a single round during an NSI gives a very false sense of realism.

To simplify tie-down procedures, we used the current three-round tie-down rack with a few modifications. The spacers on the top rack were moved closer together to facilitate the three-foot separation rule, and the tie-down straps were rerouted. With the one-round rack, we used only five straps rather than the number specified in the appropriate TM. Some form of palletizing which still provides easy access to single rounds is desirable. It may be feasible to issue trucks previously loaded to avoid transloading and improve the unit's mobility.

Emergency destruction is even more important since, by the time consideration is given to using nuclear weapons, the defensive situation is deteriorating and capture may be imminent. The standard NSI approach to emergency destruction (generally dealing with only one round) may not be feasible since off-loading 15 rounds and setting up

shape charges with detonating cord for each round may take hours to accomplish. This is not a viable solution, since the major concern is rendering the round tactically useless as quickly as possible. We experimented with placing a quantity of C4 under each tie-down rack and thus reduced the time required for destruction. In addition, one LAW (light antitank weapon) for each round was carried on the truck to destroy the rounds by weapon firing. Deliberate destruction is necessary and we must recognize the time limitations during a deliberate destruction in a fluid tactical situation.

The most critical parts of the nuclear/conventional equation seem to be *understanding* and *time*. It is critical that everyone in the decision-making chain of command understand what is required to put a reliable round on the target and what, if anything, can be traded off without endangering the unit's ability to accomplish its mission. These decisions must be timely. Assembling one 8-inch round takes time, and, if large numbers of these rounds are to be moved and fired, significant time is involved. We cannot afford to have someone "sit on" information that is required. Nothing can be done until the PAL is received. It must be available as early as possible to retain flexibility. The target analyst must continue to refine aimpoints, as well as proposed yields, and get this information to the fire

units. These are difficult decisions that must be made quickly, and, of course, the difficulty is magnified when problems exist, such as poor communication, lack of necessary information, confusion, and other adverse conditions associated with the use of tactical nuclear weapons in combat.

Horizons

The nuclear ARTEP is a superb learning experience and that is somewhat disquieting, since we should already know these things. The techniques used should be second nature, and the problems should have been solved. The marriage of nuclear operations and conventional artillery should be old — not new.

Do we *really* believe that we may need to use tactical nuclear weapons? ☒

MAJ Donald K. Griffin is currently assigned as G3, 4th Division. At the time of the ARTEP, he was the Executive Officer, 1st Battalion, 27th Field Artillery.

CPT Thurman R. Smith is currently assigned as the Executive Officer, 1st Battalion, 27th Field Artillery. He was the Battalion S3 at the time of the ARTEP.



**DEPARTMENT OF THE ARMY
UNITED STATES ARMY FIELD ARTILLERY SCHOOL
FORT SILL, OKLAHOMA 73503**

**MEMORANDUM FOR: National Guard Redlegs
US Army Reserve Redlegs**

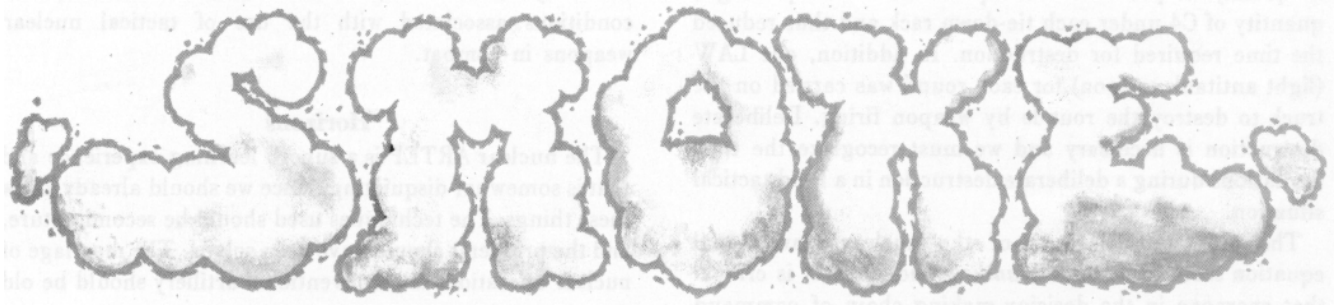
SUBJECT: Invitation

1. Recent returns of the annual *Journal* Readership Survey have contained scores of comments regarding lack of material pertaining to the addressees.
2. The *Field Artillery Journal* is the magazine of FIRE SUPPORT — not just Active Army. Addressees (as well as USMC, USN, USAF personnel involved in fire support) are cordially invited to submit articles, feature items, and letters — we can't print it if we don't get it. The *Journal* address is inside front cover.
3. Get it on!

FOR THE EDITOR:

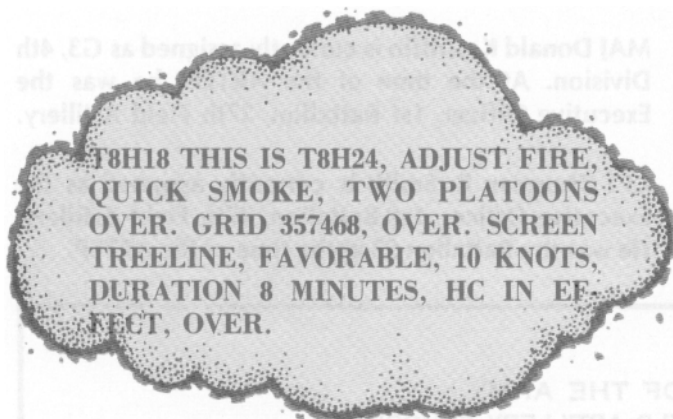
Journal Staff

Simplified



by MAJ Michael F. Mitrione

He had to determine the number of platoons to fire using the table of quick smoke data (figure 1). The wind speed could usually be obtained from the equivalent wind scale



The above call for fire provides the fire direction center (FDC) with all the information needed to compute firing data, but requires such detailed planning by the forward observer (FO) that the typical FO is apprehensive whenever the word "smoke" is mentioned. One might wonder why they ever called this procedure "quick" smoke, since it is anything but quick. Before the observer could transmit such a message he had to consider:

- Approval of the maneuver battalion commander.
- Alternative should the smoke be ineffective.
- Time to be effective and duration.
- Means available and ammunition available.
- Location and width of target to be obscured or screened.
- Wind speed and direction.
- Atmospheric stability.

This procedure, although time-consuming and cumbersome, met the needs. However, comments from field units showed, based on practical experience, that the smoke procedures outlined in FM 6-40-5 needed to be revised. Until now the employment considerations of the FO have been so numerous and contained so many variables that the observer had to carry some type of reference material or end up conducting the mission by the "seat-of-his-pants."

TABLE OF QUICK SMOKE DATA *

Weapon/Ammo		Width of Target to be Obscured in Meters								
		Wind Direction **								
		Cross			Quartering			Head/Tail		
155mm	HC	400	500	600	300	400	500	100	200	300
	WP ***	200	300	400	150	250	350	100	200	300
105mm	HC	300	400	500	200	300	400	100	200	300
	WP ***	100	200	300	100	200	300	100	200	300
Platoons to Fire		1 Plt	2 Plt	3 Plt	1 Plt	2 Plt	3 Plt	1 Plt	2 Plt	3 Plt

* For planning purposes using a normal battery front or with terrain position corrections applied.

** The wind direction is with reference to the maneuver-target line.

*** For WP there must be a wind of at least 10 knots.

Figure 1. Quick smoke data.

table (figure 2), the "grass drop" (expedient) method, or by guessing — which was the normal case even after using one of the first two.

EQUIVALENT WIND SCALE TABLE

KNOTS	OBSERVATION
1	Smoke, vapor from breath, or dust raised by vehicles or personnel rises vertically/no leaf movement.
1-3	Direction of wind slightly shown by smoke, vapor from breath, or dust raised by vehicles or personnel. Slight intermittent movement of leaves.
4-6	Wind slightly felt on face/leaves rustle.
7-10	Leaves and small twigs in constant motion.
11-16	Wind raises dust from ground/loose paper and small branches move.
17-21	Small trees with leaves sway/coastal wavelets form on inland waters.
22-27	Large branches on trees in motion/whistle heard in telephone or fence wires.
28-33	Whole trees in motion/inconvenience felt walking against wind.

Figure 2. Wind scale table.

Atmospheric stability could be obtained from "The General Atmospheric Conditions and Effect On Smoke" table (figure 3). There is even a table for determining the correct adjusting point (figure 4).

To compound the problem the observer had to consider all these factors while bouncing along in an M113, brushing

WIND SPEED?
WIND DIRECTION?
CLOUDS?
TIME OF DAY?

GENERAL ATMOSPHERIC CONDITIONS AND EFFECT ON SMOKE

SMOKE CONDITION (Temperature Gradient)⊕	Time of Day Weather Conditions	Expected Smoke Behavior as the Smoke Drifts Downwind. (Wind Direction - - - - -)
IDEAL (Inversion)	1. NIGHT - until 1 hour after sunrise. 2. Wind speed less than 5 knots. 3. Sky cover less than 30 percent. ALL THREE CONDITIONS MUST BE MET.	Stable condition - Ideal for smoke employment.
FAVORABLE (Neutral)	If not Ideal or Marginal. This condition will occur most often 1-2 hours before and after sunrise and whenever the wind speed is 5 knots or more and/or the sky cover is 30 percent or more.	Neutral condition - Favorable for smoke employment.
MARGINAL (Lapse)	1. DAY - beginning at 2 hours after sunrise. 2. Wind speed less than 5 knots. 3. Sky cover less than 30 percent. ALL THREE CONDITIONS MUST BE MET.	Unstable condition - Marginal for smoke employment.

Figure 3. General atmospheric conditions.

Delivery Technique	Wind Direction				Adjusting Point With Respect to:	
	Cross	Quartering	Head	Tail		
Quick (Small area/Suppression)	WP	200S-150UW	200S-75UW	100S	200S	Area to be obscured or screened on MT line
S-Short UW-Upwind	HC	200S-200UW	200S-150UW	100S	400S	
		Data in meters		105mm and 155mm howitzer		

Figure 4. Determining the adjusting point.

the snow off his map, receiving guidance from the maneuver commander, etc.

There had to be a better way!

The smoke doctrine has been reviewed with the objective of streamlining the observer procedures. The first question addressed was the necessity for including "Quick Smoke" in the warning order. It's not done for any other shell/fuze combination where high explosive (HE) will be used in adjustment. Why do it with quick smoke? The consensus of opinion was: There is no reason. It easily could be included in the method of engagement but not as *quick* smoke in effect. The term "quick smoke" was initially adopted to differentiate it from a "special" smoke technique which is no longer used. It was determined that the observer could therefore announce "Smoke in effect" without causing confusion.

Further investigation showed that many of the tasks required of the FO could be done easier by the FDC since the FDC has the necessary references. Given the target width and wind direction, the FDC can easily determine the number of platoons required to screen the target. In addition, atmospheric stability conditions would be as available to the FDC as the FO. Wind speed obtained from Line 00 of the current meteorological message would be as accurate as the observer's guess.

Another question addressed was the procedure observers used to locate an adjusting point. It was relatively easy to determine a head or tail wind, but was much more difficult to differentiate between a crosswind and a quartering wind. To simplify things for the observer, it was decided to consider any wind direction, which was not a headwind or tailwind, as a crosswind and establish standard adjusting points with relation to the MT (maneuver-target) line (figure 5).

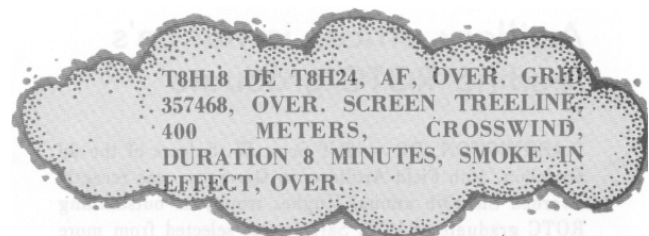
Wind Direction			Adjusting point with respect to:
Cross	Head	Tail	
200S-200UW	100S	400S	Area to be obscured or screened on MT line.

Figure 5. Determining the adjusting point for smoke.



Art by Donna Covert.

As a result of this "relook" at smoke, the observer's call for fire would be:



Based on this call for fire, the FDC, using the same tables the FO used, can determine that one 155-mm platoon is needed. The observer can begin adjusting HE immediately while the FDC determines smoke conditions, wind speed, rate of fire, and smoke replenishing time. The burden on the observer is reduced and the maneuver unit commander gets what he wants — responsive fire support.

Smoke procedures outlined in this article are being incorporated into TC 6-40-4 (Fire for Effect) and FM 6-40, currently under revision. ☒

MAJ Michael F. Mitrione is Chief, Fire Direction Division, Gunnery Department, USAFAS.

Field Artillery flux

Three significant changes have taken place in Field Artillery battalion locations or status:

As of 30 September, the Korea-based 1st Battalion (Honest John), 42d FA will be deactivated, cutting the strength of the 4th Missile Command by 294 soldiers. This reduction had been planned for some time and is not part of the Carter administration's plan for US reductions in Korea.

On the other side of the globe, two 2d Armored Division Artillery battalions will flip-flop as the FA portion of Brigade '75. The 1st Battalion, 78th FA departed Fort Hood on 23 August to replace the 1st Battalion, 14th FA in Germany. The 1-14th will return to Hood and rejoin the 2d AD after its 6 months temporary duty in Europe.

Artillery officer is nation's leading ROTC graduate

WASHINGTON, DC — 2LT Scott W. Salyers of the 3d Battalion, 16th Field Artillery, in Germany, was recently awarded the 13th annual Hughes trophy as outstanding ROTC graduate of 1976. Salyers was selected from more than 5,000 Army ROTC graduates for his academic and leadership accomplishments.

A graduate of Michigan State University, Salyers headed his graduating class of 7,343. He was awarded the Legion of Valor medal for achievement, a distinguished graduate award, and a National Merit scholarship. He is a member of Phi Beta Kappa.

The Hughes trophy is a perpetual award provided by the Hughes Aircraft Company and the Army to the outstanding ROTC graduate in 285 participating colleges and universities. Salyers, a native of Battle Creek, MI, received the trophy from Secretary of the Army Clifford Alexander in a ceremony at the Pentagon.



German LTC Hans Gershick compares notes with MAJ Arthur A. Lovgren, US liaison officer stationed at the German Artillery School, Idar-Oberstein. The two officers taught together at West Point. (Official Bundeswehr photo)

Our man in Idar Oberstein

IDAR OBERSTEIN, GERMANY — The harmonization of doctrine and a study of German training efficiency are the goals of MAJ Arthur A. Lovgren, USA Field Artillery Liaison Officer assigned to the German Artillery School.

"We intend to learn how the Germans plan to fight," says the Chicago, Illinois native. "Harmonization of doctrine through standardization of equipment and procedures is our goal."

Germany is virtually home ground for the 1962 West Point graduate, who is currently on his third tour in Europe. Previous European tours include serving as a battalion executive officer, studying at Mainz's Gutenberg University and a MAAG assignment in Bonn.

Two main areas that will receive his attention are training developments and combat developments.

MAJ Lovgren will also improve German-American relations by coordinating Project Partnership activities between the school and 8th Infantry Division Artillery units located near Idar-Oberstein.

CBR clothes make the man — safe

FORT BRAGG, NC — Seventy members of A Battery, 1st Battalion, 73d Field Artillery, recently performed normal training tasks while wearing full chemical, biological, and radiological (CBR) protective clothing and masks. The exercise was to familiarize troops with the specially treated jacket, socks, trousers, and gloves and to evaluate their performance while wearing the clothing.

Troops loaded and fired the howitzers, issued ammunition, and communicated while wearing the protective clothing and masks, with the only apparent difficulty being handling a pencil while wearing the gloves.

The clothing was comfortable on cool mornings, but some troops thought it might be otherwise on hot days. All agreed that it would be most welcome in the event of an actual chemical attack.

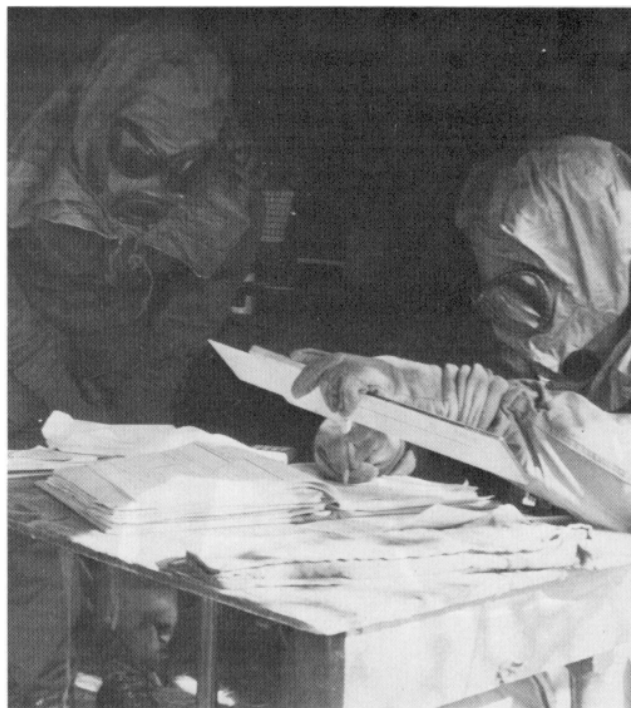
Record-keeping idea solves nuclear surety problems

FORT HOOD, TX — Record-keeping problems, involving personnel who deal with nuclear weapons, have been solved to a great extent by Fort Hood's 2d Armored Div Arty. A new system of compiling all nuclear surety records at a central location has resulted in deficiency-free records inspections according to CPT Donald Madden, Div Arty OIC for Nuclear Surety.

The location chosen for Div Arty's nuclear surety records is the Div Arty Aid Station where a physician's assistant was assigned to help smooth out the process for maintaining the medical records. These steps solved two of the nuclear surety program's biggest problems — record accountability and medical record processing and maintenance.

The system worked so well that Div Arty invited all of the other brigades in the division to turn over their nuclear surety records to the Aid Station for maintenance. Now all the 2d Armored Division's nuclear surety related records are in one location.

Another benefit from the new records system is a more equitable distribution of the workload on Div Arty troop medical clinics plus the fact that the commander knows



Computing a firing guide the hard way, in full CBR protective clothing, this Fort Bragg artilleryman wrestles with pencil and forms.

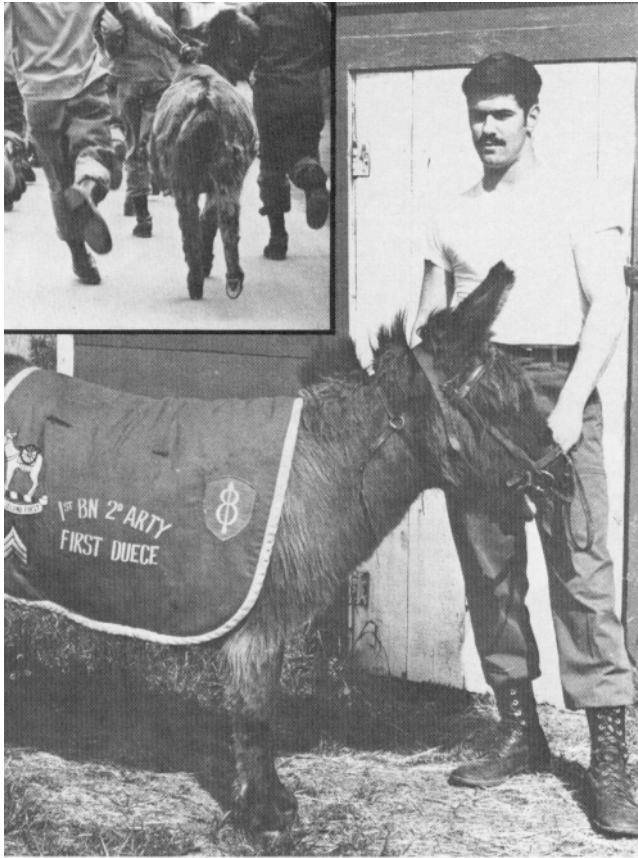
where his nuclear personnel medical records are at all times. The system of record keeping was started last January and has successfully met several levels of inspections to date.

Pacific exchange program progresses

SCHOFIELD BARRACKS, HI — Australian artillerymen were among 160 soldiers from "down under" who recently received training with members of the 2d Battalion-11th Field Artillery and Div Arty of the 25th Infantry Division here.

The Aussies were introduced to equipment, training concepts and weapons previously unfamiliar to them. Their familiarization included live-firing with the 105-mm howitzers of the 2-11th FA, water safety and gas chamber exercises.

The training is part of an exchange program in which the same number of US soldiers will be familiarized with Australian weapon systems and techniques in that country.



Duece with handler, PVT Robert Bennett. (inset) SGT Duece, mascot of the 1st Bn, 2d Field Artillery, runs at the back of the pack but only because that is his assigned place. The battalion runs two miles each day and Duece runs with it. (Photos by PV2 Carol R. Toole)

Three stripes for Johnson

BAUMHOLDER, GERMANY — "Duece Johnson, front and center!"

There were a few laughs as the trooper quietly moved to the front of the formation for his promotion to sergeant.

"Department of the Army, United States Army . . ." read the adjutant as the battalion commander prepared to pin on the NCO stripes. He had to kneel down to do it though.

SGT Johnson (known as Duece to his friends) is not your average trooper. He is only four feet tall, weighs 800 pounds, and runs the required two miles in 17 minutes with no sweat. His comrades think of him as an animal — which he is. Duece is a donkey.

He is the mascot of the 1st Battalion, 2d Field Artillery, Baumholder, Germany.

"Duece is just as much a trooper as the rest of us," says SP4 Michael Holleran, unit distribution clerk. "In fact, he has a 201 file." Rumors are that he has AWOL time though article 15s are not reflected in the official file.

He entered the service of the "Old Regulars" in 1971, carrying on the tradition of his forefathers who transported artillery pieces across mountains and other rough terrain. Today he carries a replica in ceremonies and parades. (PVT Tyrinda Dixon, PAO, 8th Infantry Division)

Military affiliation aptly applied in Colorado

FORT CARSON, CO — Artillery units from the Colorado Army National Guard and troops from Fort Carson recently combined forces for a full field training exercise considered to be the first of its kind by participating unit leaders.

The artillery units joined in a 169th Field Artillery Group tactical exercise under the 169th Commander, COL Rex W. Sjostrom. The 1st and 2d Battalions of the Guard's 157th Field Artillery shared in the firing maneuvers with B Battery, 1-27th FA, 4th Infantry Division of Fort Carson.

The joining of forces between these units is called military affiliation and is not a new concept. The two units have been formally operating together since 1975 and working together periodically as far back as 1972. The affiliation for a full exercise, however, is a first according to LTC Dennis J. Reimer, Commander, 1st Battalion, 27th FA.

"Our program seems to be working very well. Both units are using the same operating procedures and we're all learning things from one another. The coordination and cooperation have been excellent and we can identify potential problems for the future," Reimer stated.

Guard battalion commander, LTC David C. Williams of the 2d Battalion, 157th FA, said "This program is one of the most important things going for us. Because of our proximity to Fort Carson, we can come in and shoot on weekend drills, not just during our annual training. This helps keep our abilities at a high level."

Williams has been very pleased with the results so far. "It's the sister battalion, sister battery concept. The 1st Bn, 27th FA, is an integral part of our program as a unit. They've met and exceeded every requirement, providing liaison, survey, a fire direction center, a firing battery, communications, and so on."

B Battery, 1-27th FA, Commander CPT Carlos A. Ramirez commented on the first day of the exercise that "it puts us all on the same sheet of music. The integration looks like it's working well."

The combining of units provided several immediate benefits according to LTC Williams. "For example, they provided our men with blueprints for fabricated equipment to enhance our FADAC. We (the Guard), on the other hand, gave them a format for simultaneous observations, which they liked better than their own, and they adapted it to their system."

"This combined training program with the active Army units provides us the opportunity to show our abilities and the fine quality of performance we believe is in practice now within the Colorado Guard. We're happy to have a chance to participate in such a program," added Williams.

Artilleryman's award is real trip



SP4 Dean Banakes

FORT BRAGG, NC — An artillery fire direction specialist is one of two Fort Bragg soldiers recently selected to go on an all expense paid trip to Hawaii, sponsored by Army Forces Command. SP4 Dean Banakes won a trip through a FORSCOM competition to select outstanding soldiers of the year.

Banakes, who is assigned to the 1st Battalion, 39th Field Artillery, said there are two reasons he wanted to win the competition. "My wife Patricia is in the Army too, and she works harder than I do. I think she deserves a trip like this."

He explained the second reason he wanted to win: "When I arrived at Bragg, my commander said about 10 percent of us would likely be in his office at some time to be congratulated. Another 30-40 percent would be in there for punitive action. I made up my mind that I was going to be part of that 10 percent."

First of its kind

FRANKFURT, GERMANY — Another V Corps Artillery "first" was established when the 1st Battalion, 32d Field Artillery, organized and hosted a unique "first of its kind" competition recently.

The event pitted three Lance missile battalions in a 2-mile, timed, formation run during which participating battalion teams matched their skills in precision running, team performance, and esprit de corps.



Off to a confident start, the team from the 1st Battalion, 80th Field Artillery, won the 2-mile formation run in record time.

The 1st Battalion, 32d Field Artillery, challenged all USAREUR Lance missile battalions but only two units accepted the challenge. The 1st Battalions of the 80th Field Artillery and the 333d Field Artillery each trained and fielded a 22-man team eager to compete with the missilemen of the host unit.

Race rules specified that participating teams be composed entirely of assigned unit personnel. Each battalion provided two judges to evaluate each team's performance during the 2-mile run, based on running precision, dress and cover, in-step running, and esprit de corps.

According to LTC Kenneth A. Ingram, commander of the 1st Battalion, 32d Field Artillery, "Contests of this type foster a sense of wholesome competition among participants and stress teamwork. A group's overall performance depends on that of its slowest runner. I was thrilled with the way the teams competed and I'm proud of my men's performance; this event really lifted our morale."

Intelligence Sergeant, MSG James A. Coleman, originated the idea: "We wanted to demonstrate how much satisfaction and pride could be generated through teamwork and . . . spirit, and not just . . . physical fitness directives."

Competing teams covered the 2-mile formation run in combat boots within 11 seconds of each other. The 1st Battalion, 80th Field Artillery, captured first place with a local record time of 13 minutes and 46 seconds and an overall performance score of 74.8 points. Second best was the 1st Battalion, 333d Field Artillery, with 70.9 points, followed by the 1st Battalion, 32d Field Artillery, team which scored 69.7.

COL Kenneth R. Bailey, 41st Field Artillery Group commander, presented the winner's trophy to 2LT David R. Brown, team leader of the 1st Battalion, 80th Field Artillery, in ceremonies at the finish point, concluding the unique competition.

Do you really understand the ARTEP?

by MAJ(P) James L. Noyes

"To our div arty commander, the ARTEP is nothing more than an ATT."

—battery commander in Europe

"Can I flunk a unit because it's a few seconds over on one task?"

—telephone call from field

". . . the battalion just completed a portion of their Army 'Readiness' Training and Evaluation Program testing."

—unit newspaper

"Our ARTEP is next week and we haven't had time to practice."

—battery commander in FORSCOM

"Having just passed an ARTEP. . . ."

—unit newspaper

Sound familiar? These phrases were taken directly from published articles and conversations about unit training. From the viewpoints expressed, it's obvious there is still a basic misunderstanding of the purpose and use of the Army Training and Evaluation Program (ARTEP). Terms such as "taking an ARTEP" and "pass (or fail) an ARTEP" are freely used by trainers and training managers who still feel that effective training equates to peaking a unit for a big test which will measure and insure combat readiness.

It doesn't.

They are fooling themselves. Testing only shows how good a unit is on the specific day it is tested. Training is perishable.

In the past, units based their training on two documents: the Army Training Program (ATP) and the Army Training Test (ATT). Training based on the ATP/ATT system was centralized, containing a myriad of military subjects to be taught for a set number of hours. It culminated in the annual test of a unit to determine combat readiness. Neither the ATP nor the ATT identified critical combat tasks in the form of performance-oriented training objectives.

This philosophy was designed for unit mobilization training in preparation for war. The days of having ample time to train a unit to fight before it goes into combat are long gone. Active Army CONUS units and certain Reserve Component units must be able to fight and survive on the modern battlefield within a few days' notice of deployment. Overseas units have even less time — perhaps only a few hours. Cyclical training of units leaves too many gaps and does not insure that a unit will be combat-ready when the time comes.

Training Circular (TC) 21-5-7, *Training Management in Battalions*, says it well: ". . . it can be demonstrated that intensive training once a year is simply not enough to provide the proficiency that is required for individual or crew readiness . . . readiness requires that the training manager discard the "annual" conduct of marksmanship, gunnery, or other exercises."

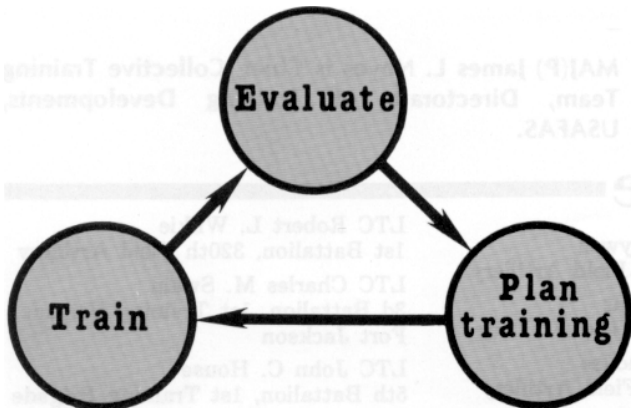
The question of just what an ARTEP is has caused more argument and frustration than any other recent development in the training field. Is the ARTEP simply another ATT or ATP cleverly hidden behind a new acronym, or is it something new based on a totally different concept of training?

What is an ARTEP?

The Army Training and Evaluation Program was developed to fill a significant void in training guidance to the field.

- It supports the Army's new performance-oriented training policy.
- It replaces the ATP and ATT in both content and philosophy.
- It is the recognized DA publication for collective training.
- It identifies realistic critical combat tasks that must be performed by sections, batteries, or battalions under stated conditions to specific standards.
- It is based on TOE, doctrine, mission, and weapons capabilities.
- It is designed to assist commanders in evaluating, planning, and conducting unit training on a *continuous* basis.

One of the key purposes of the ARTEP is to level off the peaks and valleys of the training profile and formulate a more consistent way of training. The procedures for using the ARTEP to achieve and maintain a high level of training are depicted in this three-step, closed-loop process:



For the ARTEP to be effective, everyone must embrace the concept that it is designed solely as a tool for the commander's use in training or evaluation, with the

emphasis on training. Evaluation does not equate to the traditional form of testing. Evaluation is an aid to the commander to determine his unit's status of training. Evaluation *must* take place at the beginning of any training program. This will tell leaders where the unit's weak spots are and serve as the basis for developing a corrective training program. Training is then conducted based on ARTEP training objectives.

For example, a Reserve Component unit is going to undergo its annual training (AT). Before hitting the major training area, the unit should have planned, as the first event of AT, an evaluation of their unit based on the ARTEP to determine the strengths and weaknesses of their training posture. Evaluation can be done at section, battery, or battalion level depending on command guidance. From this initial evaluation a reasonable training program can be developed and executed.

Meaningful training management

FM 21-6 says it very succinctly: "Evaluation of training is a continuous process. As a result of emphasis on "learning by doing," the trainer receives continuous feedback on the progress of those being trained. This reduces the need to wait for the end of training test results. The very end of a training session is a poor time to discover that little or no learning has taken place. Immediate feedback and reinforcement that a unit has accomplished the objective satisfies learning and motivation. Conventional training uses *grades to rate*; performance-oriented training *sets standards which must be met*."

The ARTEP is flexible and gives the commander a wide-open door to get on with the business of training and away from the business of testing. For example, here are quotes from references about this:

- TC 21-5-7: "Units should use the ARTEP to train and evaluate themselves — to diagnose their strengths and weaknesses. ARTEP status is not measured by an Army-wide test as with the SQT. Commanders . . . and their staff officers must not depend on standard documented, approved programs of required training, but must manage through mission-type orders, deliberately diversifying training programs and dispersing training into small groups. They must not be concerned with procedure, but with results."

- Forces Command Regulation 350-1, *Training*: "Commanders should view ARTEP evaluations (internal/external) as guides to assist in accomplishing their training objectives. Commanders are not required to assign a rating of satisfactory/unsatisfactory upon completion of evaluations. Training status at the time of evaluation is . . . perishable . . . which can change quickly through execution of a properly tailored training program or by . . . personnel turbulence . . . change of mission or organization."

- Fort Sill Regulation 350-1, *Training*, incorporates the philosophy of the FORSCOM regulation and further states: "The purpose of an external evaluation is to *train*, not to grade, and identify in what areas training emphasis must be placed."

Field Artillery ARTEPs have been in the field now for almost two years. Over that period, some misconceptions have built up about ARTEP training and evaluation. Here are a few of them:

- *The external evaluation and the role of the evaluator.* When we "take" any test, there are a lot of psychological barriers raised. The test is perceived by the unit to be more of a threat than a learning experience. This happens when a battery or battalion is sent to the field and put through its paces so the div arty/group commander can "see how good it is."

If the unit gets a certain amount of adrenaline flowing and feels a sense of mission accomplishment, that's great. But, when the unit commander feels that this test is the sword over his head or the final grade on his efficiency report, other things begin to happen. Tactical initiative and boldness take a back seat to "playing it safe so I look good." Unit leadership spends more time trying to "G2" the test than it does training its troops.

Administering headquarters personnel do not participate with the unit in a total learning experience. Rather, they stand back as the experts, above reproach, and tell the subordinate command how fouled up it is. This whole outlook is wrong and counterproductive to achieving training proficiency. When an evaluator drops in with armband, clipboard, and a vehicle with an evaluator sign on it, barriers are raised and it's "Me against him." To train our units to fight means that everyone is in it together. We can no longer tolerate "me against him" situations. The role of the evaluator is to provide another pair of eyes to help train units — not grade them.


- *Unit differences.* There is no fixed approach to successful training. How often to train and evaluate to maintain proficiency can only be answered by unit trainers. Recognize that what Battery B needs to train on probably won't fit what Battery C needs. Going further, the training needs between the first and second howitzer sections are different.

Don't stereotype training patterns — rather find out what the people *need* and train on that. If you find that several gun sections are performing below standard, be careful about imposing a blanket training directive that gets every section in the battalion on the parade field for a special, quick-fix, get-well training exercise. Those sections that are well-trained and can do the job really get turned off by this. They may feel that the commander has not made it his business to know that they are good. More importantly, you are probably taking them away from other training that they really need.

Listen to the NCOs — the leaders directly charged with training troops. They know what training their troops need. And, if you expect them to properly train, make sure they have a copy of the ARTEP. The ARTEP contains section-level training objectives.

As GEN Bernard Rogers said recently, "Each element must be responsive to its leader, and our training effort must recognize the fact that basic combat elements are led by noncommissioned officers and junior officers. Every leader must be the trainer of those he leads, and we must insure that he is given the resources — particularly the time — needed to conduct the training."

- *Using all training materials.* Besides the ARTEP, there are other things to help you. The Soldier's Manuals (SMs) are to individual training as the ARTEP is to collective training. Critical tasks in the SMs support ARTEP training objectives. The ARTEP diagnostic and evaluation process is appropriate for SMs. Simulators and devices support both individual and collective training.

The ARTEP is built around a list of critical tasks that a unit must be able to perform in combat. It allows the commander the flexibility to simultaneously plan, execute, and evaluate a training program uniquely designed for his unit. The ARTEP, when properly used, can be a significant aid to the commander in achieving the ultimate goal — a well-trained unit. 

MAJ(P) James L. Noyes is Chief, Collective Training Team, Directorate of Training Developments, USAFAS.

Commanders Update

COL Henry R. O'Neil
1st Armored Division Artillery

COL Robert T. Basha
8th Infantry Division Artillery

LTC Marshall R. McRee
2d Battalion, 3d Field Artillery

LTC Barnwell I. Legge
2d Battalion, 12th Field Artillery

LTC David V. Dollner
1st Battalion, 14th Field Artillery

LTC Johnson Pennywell
1st Battalion, 19th Field Artillery

LTC Harold J. Helms
2d Battalion, 75th Field Artillery

LTC Robert D. Alhouse
1st Battalion, 82d Field Artillery

LTC William B. Ward
3d Battalion, 84th Field Artillery

LTC Herbert M. Wassom
3d Battalion, 319th Field Artillery

LTC Robert L. Wilkie
1st Battalion, 320th Field Artillery

LTC Charles M. Swain
3d Battalion, 1st Training Brigade
Fort Jackson

LTC John C. House
5th Battalion, 1st Training Brigade
Fort Jackson

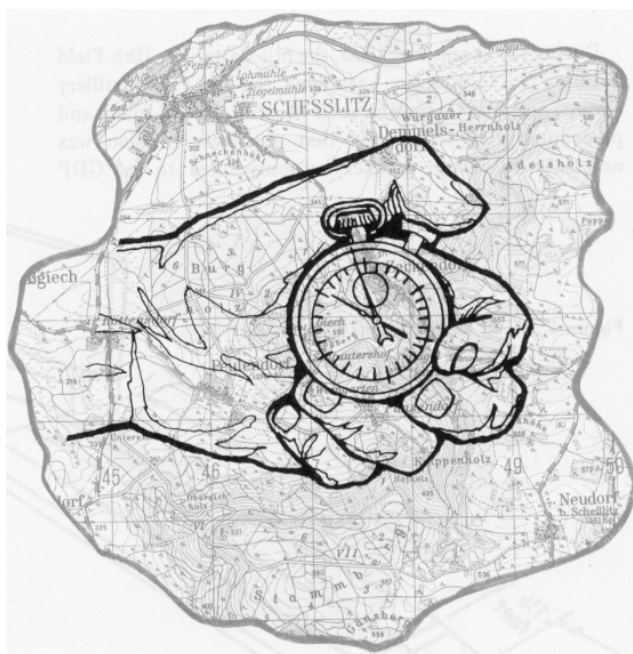
LTC Judson L. Birely
4th Battalion, 3d Training Brigade
Fort Leonard Wood

Getting to the GDP on time

by CPT Alvin S. Chandler

One answer to the European upload problem:

Within United States Army Europe (USAREUR), all artillery units are allocated a basic load of ammunition from nearby storage sites. This basic load constitutes the majority of the battalion trains. For this discussion, basic load is that quantity of ammunition which is authorized and required to be on hand within a unit at all times. Each unit is responsible for storing, maintaining, and transporting its basic load.



Battery commanders in USAREUR must consider foremostly how long it will take their unit to fire the first artillery round of basic load from a general defensive position (GDP) when "the balloon goes up." If you do not have a detailed plan and sequence of events, to include a time schedule, movement, load plans, traffic pattern, or cannot answer who, what, when, where and how, then a critical reevaluation of your current upload and readiness posture is needed. No field artillery unit can afford to be unprepared under the demands of the "modern battlefield."

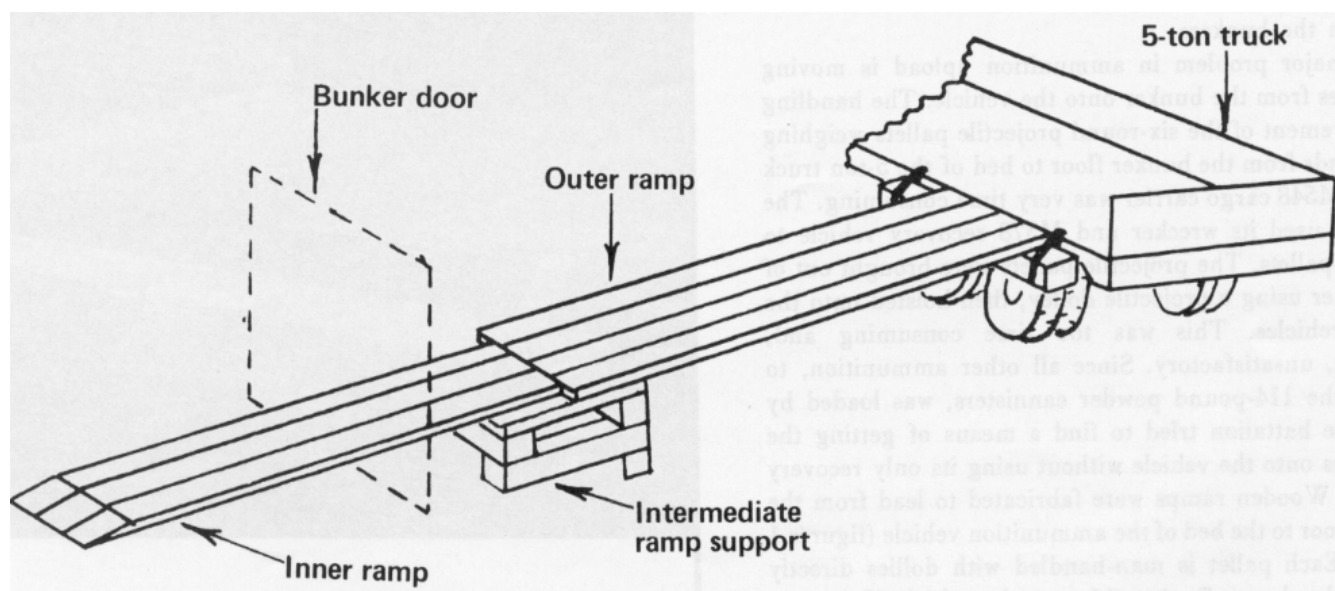
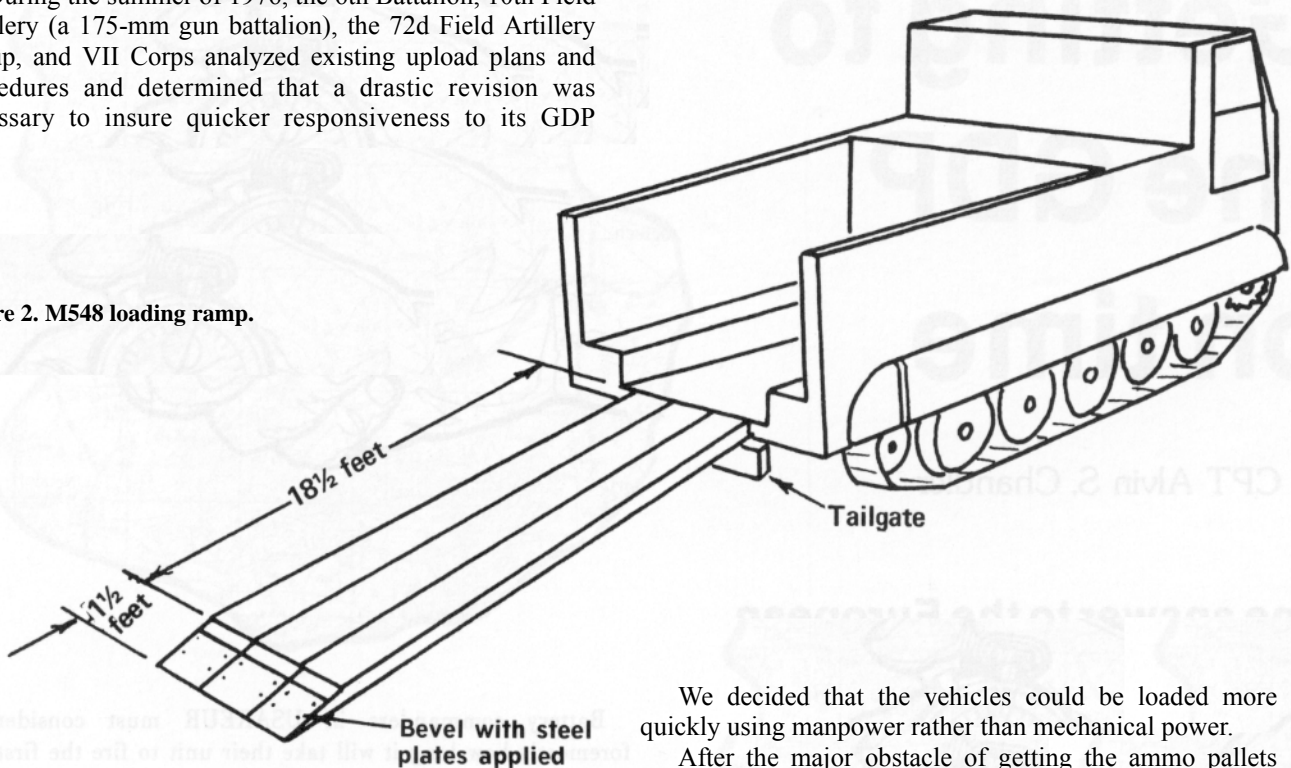


Figure 1. 5-ton truck loading ramp.

During the summer of 1976, the 6th Battalion, 10th Field Artillery (a 175-mm gun battalion), the 72d Field Artillery Group, and VII Corps analyzed existing upload plans and procedures and determined that a drastic revision was necessary to insure quicker responsiveness to its GDP

Figure 2. M548 loading ramp.



commitment. The battalion's entire basic load of ammunition was stored in a nearby storage area shared with the other units in the area. After some research into ammunition compatibility groupings, it was determined that the battalion's basic load was stocked in depot storage configuration, not permitting the mixing of compatibility groups for complete round configuration. It was also realized that the small arms ammunition did not have to be stored in the bunkers.

The major problem in ammunition upload is moving projectiles from the bunker onto the vehicle. The handling and movement of the six-round projectile pallets weighing 948 pounds from the bunker floor to bed of the 5-ton truck and the M548 cargo carrier was very time consuming. The battalion used its wrecker and M578 recovery vehicle to load the pallets. The projectile pallets were brought out of the bunker using a projectile dolly, then hoisted onto the ammo vehicles. This was too time consuming and, therefore, unsatisfactory. Since all other ammunition, to include the 114-pound powder cannisters, was loaded by hand, the battalion tried to find a means of getting the projectiles onto the vehicle without using its only recovery vehicles. Wooden ramps were fabricated to lead from the bunker floor to the bed of the ammunition vehicle (figures 1 and 2). Each pallet is man-handled with dollies directly from the bunker to final position on the vehicle (figures 3, 4, and 5).

We decided that the vehicles could be loaded more quickly using manpower rather than mechanical power.

After the major obstacle of getting the ammo pallets onto the carriers was overcome, relocation of ammunition for loading and management was studied. With the loading ramp concept, each firing battery was assigned a single two-door bunker for storage of its ammunition to provide a one-stop operation.

One door is serviced by a 5-ton truck ramp and the other with an M548 ramp. The small arms ammunition was relocated in garrison. Only noncompatible basic load was stored separately.

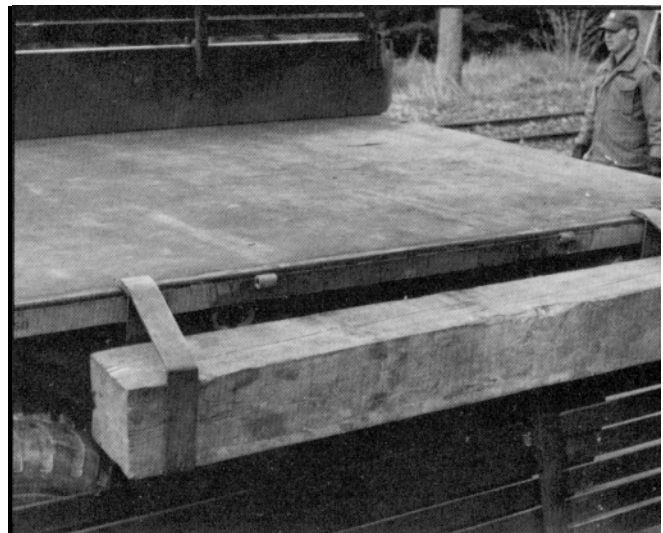


Figure 3. Support beam mounted on truck.

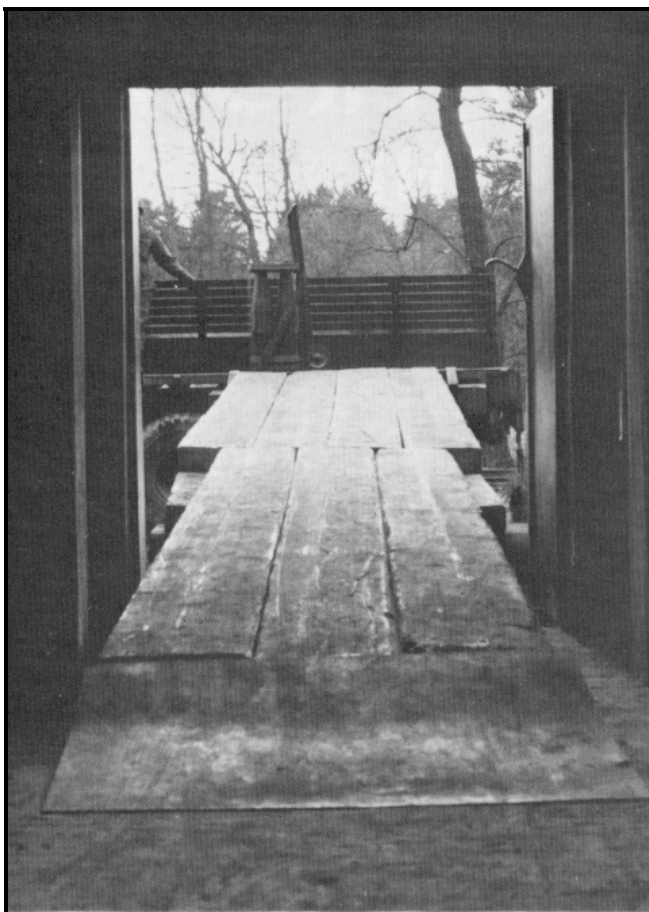


Figure 4. Constructed 5-ton ramp.

At the outset of the loading exercise, one M548 and one 5-ton truck from each battery are brought forward from the holding area and positioned at the appropriate doors. Ramps are emplaced and loading is conducted under firing battery control. The battalion ammunition officer provides overall coordination in the storage area. He calls for empty vehicles as required, directs the disposition of loaded vehicles, and provides backup ammunition vehicles as required. Ammunition is broken down by complete round configuration and by vehicle load within the bunkers. In a load out, the ammunition vehicles deploy to the ammunition bunkers under control of the ammunition officer while the firing batteries move to their local dispersal areas (LDA). The loaded ammunition vehicles marry up with the batteries in the LDA or GDP, facilitating more immediate and timely fire support.

The service battery ammunition section loads all small arms/crew-served ammunition from its garrison location. Small arms are issued prior to moveout to the LDA or in the LDA, depending on the situation.

The battalion is now capable of loading the complete basic load in one-fourth the time it used to take. The first


loaded vehicles are dispatched and moving in less than 30 minutes once the loading operation commences.

A number of advantages have resulted from this system:

- There is no requirement for recovery vehicles to upload the basic ammunition load — they can march with the battery convoys.
- All bunkers can be emptied simultaneously.
- Control of upload can be delegated to firing battery level.
- Greater flexibility is allowed in the upload plan.
- Periodic upload rehearsals require less time.

The upload system has immeasurably increased the readiness posture of this battalion. Once the materials were obtained, construction of the ramp system was accomplished entirely by personnel of the battalion using organic equipment. If all materials are on hand, fabrication of the complete system can be completed in less than five days.

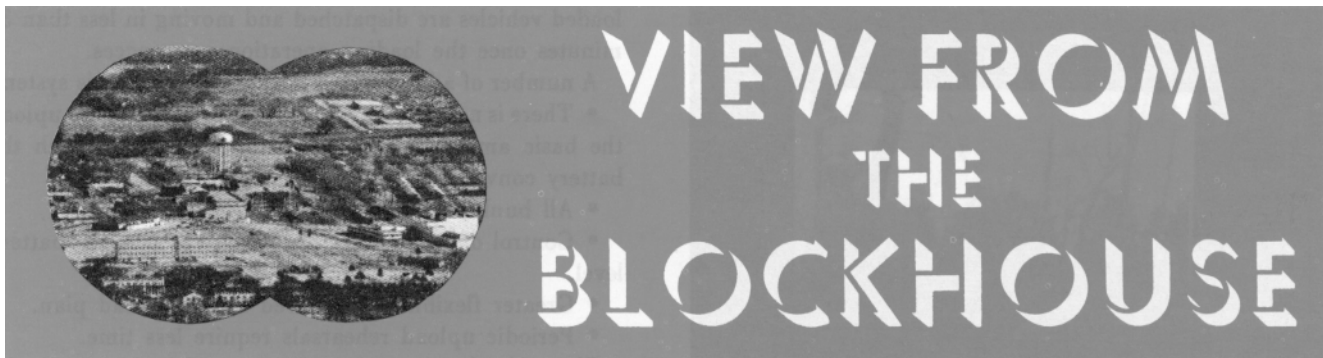
The most important lesson learned is that mechanization is not always the answer; manpower may be the better solution. The next time a problem arises, analyze carefully — three steps backward may provide a better solution than one step forward. In this example, the old way was better.

The upload system is another step toward furthering the VII Corps motto of "they shall not pass." 

CPT Alvin S. Chandler is presently commander of A Battery, 6th Battalion, 10th Field Artillery. At the time of development of the upload system, he was in command of Service Battery, 6-10th FA.



Figure 5. Movement onto vehicle bed.



EFC factors for M109A1 SP howitzers

There has been some confusion in the field as to the equivalent full charge (EFC) factor to use for charge 7 when filling out the Weapons Record Data Card (DA Form 2408-4) for the 155-mm SP howitzer M109A1. Should it be 0.70 as listed in the tabular firing tables (FT 155-AM-1 and FT155-AN-1), or should it be 0.75 as listed in the TM for the weapon (TM 9-2350-217-10N) and the new TM 9-1000-202-14?

The Armament Research and Development Command, Watervliet Arsenal, confirms 0.75 as the correct EFC factor for use with charge 7, white bag.

FT 155-AN-1 (Nov 76) is being changed to show 1.33 as the value for number of rounds equivalent in fatigue to one full charge to zone 7W and 0.75 as the value for equivalent fatigue effect for zone 7W.

Also, a sentence will be added stating that the cannon tube has a dual condemnation criteria — 5,000 EFC rounds or 0.150 wear (6.250 bore diameter) — whichever comes first.

FT-155-AM-1 (Sep 72) will be changed to reflect the new data.

In summary, for your M109A1 SP howitzers, use the following EFC factors when computing data for Weapons Record Data Cards:

Charge	EFC Factor
Zone 8	1.00
Zone 7	0.75
Zones 1-6.....	0.25

Cutting a ribbon during ceremonies to mark the opening of the MG William J. Snow corner at Fort Sill's Snow Hall is newly promoted CPT William A. Snow II, great grandson of the general. Observing at the ceremony are BG Albert B. Akers, assistant commandant of the school, the captain's father, William J. Snow II, and the captain's son, William R. Snow, representing the fifth generation of Snows since the general.

Snow Hall holds double ceremony

Ceremonies dedicating an area of Snow Hall to the memory of MG William J. Snow, the Army's first Chief of Field Artillery, were recently arranged to coincide with the promotion to captain of William A. Snow II, the general's great grandson.

The dual ceremonies took place in the building named after the general and provided a place for the memorabilia of his career. The centerpiece of the Snow display is a formal oil portrait of the General. Included are his standard as Chief of Field Artillery, his appointment as a cadet to the military academy, a cadet photo, his commission and medals.

Major General Snow was credited with organizing the effort to train artillerymen during World War I and became the first Chief of Field Artillery in 1918. Captain Snow is currently attending the FA Officers Advanced Course. He is a 1973 graduate of the US Military Academy and was assigned to a Lance missile unit here for three years.



FADAC tape status

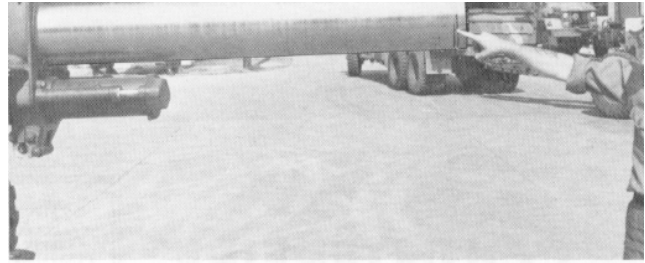
The use of the correct and current firing data source is essential for the accurate and safe delivery of artillery fires. Numerous materiel developments and product improvements have been introduced in recent years which have vastly expanded the possible weapon/ammunition combinations. Many of these combinations are ballistically dissimilar which has resulted in a large number of different FADAC items.

The kits and the cartridge assemblies containing the program tapes are stock funded items that must be purchased from OMA funds. Requisitions must include **B14** as the routing identifier. Questions concerning the status of a requisition should be addressed to ARMCOM **B14**, Rock Island, IL 61200, telephone AUTOVON 793-6409/6897/6608.

The nomenclature, national stock number (NSN) and part number of the Revision 5 material are shown below:

Nomenclature: Cartridge assembly, cannon program tape, Revision 5		
Item	NSN	Part Number
M101A1, 105-mm how	1290-00-229-4722	8213330-109
M102/M108, 105-mm how	1290-00-229-4723	8213330-110
M114A1, 155-mm how	1290-00-229-4724	8213330-111
M109/M114A2, 155-mm how	1290-00-229-4731	8213330-112
M109A1, 155-mm how	1290-00-207-9462	8213330-113A
M110/M110E1, 8-inch how	1290-00-229-4736	8213330-114
M107/M107E1, 175-mm gun	1290-00-229-4750	8213330-115
M110A1, 8-inch how	1220-01-021-4125	8213315-123

Nomenclature: Kit, Accessory, Revision 5		
Item	NSN	Part Number
Kit, Accessory Revision 5	1290-00-148-7757	11745025
Case, carrying (1 ea)	1290-00-548-3291	11728883
Flag Card (5 ea)	1220-01-005-9002	11745026
Window, matrix 1, fire control (5 ea)	1220-01-005-9004	11745028
Window, matrix 2, survey & chronograph (5 ea)	1220-01-005-9003	11745027
Tape Assembly, diagnostic (1 ea)	1220-01-005-9000	11745029
Decal (1 ea)		10526772
USAFAS Reference Note Jan 75 (5 ea)	Program control	
Card, Trouble Shooting Guide (5 ea)		



The modified tube of the M114A2 155-mm towed howitzer is indicated by SP4 Joseph L. Shattuck of C Battery, 1st Battalion, 73d Field Artillery, Fort Bragg, NC. Development of the new tube represents a quantum improvement in the capability of the 155-mm towed howitzer according to Mr. C. B. Turpin of the School's Weapons Department. The improvement is due to a one-in-twenty caliber length twist to the tube rifling as opposed to a one-in-twenty-five twist in the older M114 and M114A1 towed howitzers. The modified tube can fire all of the new family of 155-mm projectiles. It can use the same series of tabular and graphical firing tables and the same fire control input for TACFIRE and FADAC as the M109 self-propelled howitzer. (Photo by SGT Bill Freeman.)

Units that have the interim M109A1, 155-mm howitzer program tape (PN 8213330-113) on hand should requisition the final program tape (PN 8213330-113A) to replace the interim tape. Those units that have the accessory kit for use with the interim tape need not requisition an additional accessory kit. However, those units not ordering an accessory kit may obtain copies of the Jan 75 USAFAS reference note by contacting the Field Artillery School.

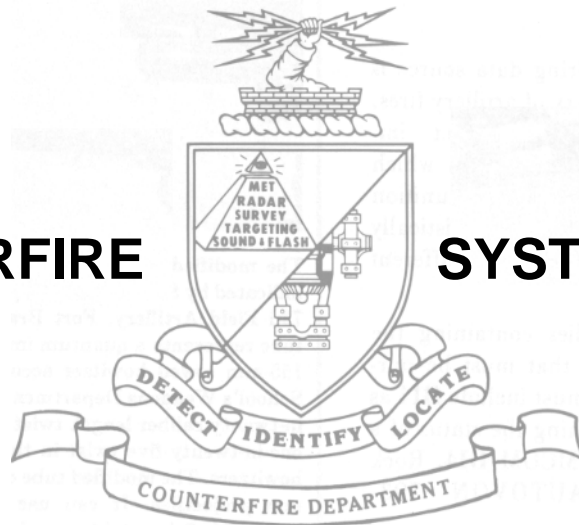
The nomenclature, national stock number (NSN) and part number of the Revision 4 material are shown below:

Nomenclature: Kit, Program Tape, Cannon (4 items) 1290-00-466-0140		
Item	NSN	Part Number
Cartridge assembly cannon program tape	1290-00-466-0141	8213330-80
Tape set, weapon addendums	1220-00-150-9029	8213330-81 thru 95
Window, matrix (5 ea)		10559725
Flag card (5 ea)		10559724

M31 Field Artillery Trainer Tape Status

Nomenclature: Cartridge Assembly Program Tape (2 ea)		
Item	NSN	Part Number
Cartridge Assembly program tapes	1290-00-275-1700	8213315-118
Window, matrix 1 & 2 (use Rev 5 accessory kit)		
TT 6-40-3A, Operator Procedures (USAFAS pub.)		

COUNTERFIRE



SYSTEMS REVIEW

SIAGL is coming

The SIAGL (Survey Instrument, Azimuth Gyro, Lightweight) is the replacement for the existing azimuth gyro at battalion and division level. The SIAGL is a lightweight, man-portable, north-seeking gyroscope which will provide the field artillery with an all-weather direction-determining capability, reducing the time required to perform a directional traverse by one-half.

Based on the results of final tests, the Army purchased 93 instruments, 63 of which are earmarked for Europe.

The SIAGLs will be shipped to Europe and Korea initially. The Army plans to buy an additional 200 SIAGLs to fill all requirements. The basis of issue is one instrument to each direct support (DS) battalion, two per general support battalion, six per Lance battalion, and two per division artillery. The Field Artillery School has recommended that each DS battalion be issued two SIAGLs instead of one.

USAREUR TAB activations

A principal element of the counterfire doctrine is the establishment of target acquisition batteries (TAB) for division artillery. Department of the Army has announced that these target acquisition batteries would be activated during a 24-month period, beginning in the 3d quarter FY76. Simultaneously, existing target acquisition battalions would be deactivated with personnel and equipment from these battalions forming the core for the new TABs.

The TABs in Europe will be activated during FY77 and assigned as follows:

Btry C (TA), 333d FA, to 8th Inf Div (Mech)
Btry F (TA), 333d FA, to 3d Armd Div
Btry B (TA), 29th FA, to 3d Inf Div (Mech)
Btry F (TA), 29th FA, to 1st Armd Div
Target acquisition battalions that will be deactivated during FY77 are as follows:

2d Bn, 25th FA, VII Corps Arty
1st Bn, 26th FA, V Corps Arty

Six moving target locating radars (AN/TPS-58B) are scheduled for shipment to USAREUR TABs in October 77. The new transistorized sound ranging sets (AN/TNS-10) are available for issue and will be shipped upon receipt of unit requisitions.

National Guard TABs activated

In response to the Army's Counterfire doctrine the following National Guard target acquisition batteries (TABs) have been activated:

Btry E (TA), 139th FA, 38th Inf Div (Indiana NG)
Btry F (TA), 144th FA, 40th Inf Div (Mech) (California NG)

Btry E (TA), 151st FA, 47th Inf Div (Minnesota NG)

The following target acquisition battalions have been deactivated:

1st Battalion, 28th FA (Missouri NG)
1st Battalion, 140th FA (Utah NG)

The 1st Battalion, 171st FA (Oklahoma NG) has deactivated one battery (C Btry). There are plans to activate TABs for all eight National Guard div arties.

Survey form status

The Survey Branch has new survey forms for use with the SR-56 Texas Instrument calculator.

These new forms are easily identified by the symbols representing calculator buttons which show step-by-step computations. Copies of these new calculator forms are now available from AG publications centers at St. Louis and Baltimore. The forms may be ordered by following the directions in DA Pamphlet 310-2. If you cannot find the DA form number and title in DA Pam 310-2, use the number and title listed in figure 1, which also gives the original Fort Sill "test" number in case your unit has some copies remaining from the initial distribution.

Those units which do not have Texas Instrument SR-56 calculators may continue to use the older logarithmic survey forms. However, the AG Pub center now lists these forms with new DA form numbers. A list of these new numbers is given in figure 1.

When your unit receives DA Form 4602-8, you *must* make pen and ink changes so that line 23b (all three columns) reads:

IF DISPLAY —; + 6400 =

Continue to make this change until corrected editions of the form reach the field.

Comments, suggestions, or questions about these forms should be addressed to USAFAS, ATTN: ATSF-CF-SV; or call AUTOVON 639-2805.

Has your unit been issued the correct calculator? Reports indicate some units have been issued calculators other than the Texas Instrument SR-56.

Supply Catalog SC 6675-97-CL-E29, June 1976, gives the correct NSN and description as "7420-00-366-6796, calculator, non-listing, 10-digit display." Although the catalog describes the calculator as the Hewlett-Packard Model 25, make sure that your unit gets the Texas Instrument SR-56 calculator.

The same catalog has information on a new 30-meter steel tape. This steel tape is graduated in centimeters along its entire length, making it easier to break tape. This new tape is identified as "NSN 5210-00-540-2981, tape measuring, 30 meters."

Manual computation survey form numbers		Form title	SR-56 calculator survey form numbers	
Old DA	New DA		Fort Sill	DA
6-1	4211	Computation-Azimuth and distance from coordinates.	1403-R	4602-1
6-2	4214	Computation-Coordinates and height from azimuth, distance, and vertical angle.	1404-R	4602-2
6-7A	4014	Computation-Plane Triangle.....	no form	
6-8	same	Computation-Plane Triangle.....	1405-R	4602-3
		coordinates and height from one side, three angles and vertical angle.		
6-10	4009	Computation-Astronomic	896-R	4602-14
		azimuth by hour-angle method, Sun.		
6-10A	4009A	Computation-Astronomic	897-R	4602-15
		azimuth by hour-angle method, star.		
6-11	4109	Computation-Astronomic	1406-R	4602-4
		azimuth by altitude method, Sun or star.		
no form		Computation-Astronomic	1407-R	4602-5
		azimuth by Polaris tabular method.		
6-19	4110	Computation-Coordinates and	1408-R	4602-6
		height, 3-point resection.		
6-20	3913	Computation-Convergence	no form	
		(astronomic azimuth to UTM grid azimuth).		
no form		Computation-Convergence	1409-R	4602-7
		(astronomic or gyroscopic azimuth to UTM grid azimuth).		
6-21	4175	Computation and instructions.....	no form	
		for use with star identifier.		
no form		Programmed computation	677-R	4602-8
		Coordinates and height from azimuth, distance and vertical angle.		
6-22	*	Computation-Conversion	944-R	4602-13
		UTM coordinates to geographic coordinates.		
6-23	*	Computation-Conversion	951-R	4602-9
		geographic coordinates to UTM coordinates.		
6-34	4259	Zone to zone UTM grid.....	933-R	4602-11
		azimuth transformation.		
6-36	4212	Zone to zone UTM grid.....	962-R	4602-10
		coordinate transformation.		
29-72	2972	Field record and.....	672-R	4602-12
		computations — DME.		
5-72	4446	Level, transit and.....	no form	
		general survey record book.		

* These forms plus DA Forms 6-2B, 6-18, 6-25, 6-27 and 5-139 have all been discontinued.

Looking for a way to use your M91? The 101st Div Arty "has a better idea." (Reproduced courtesy of ARMY Magazine, copyright 1977.)

Slammer

by CPT R. F. Parker Jr.

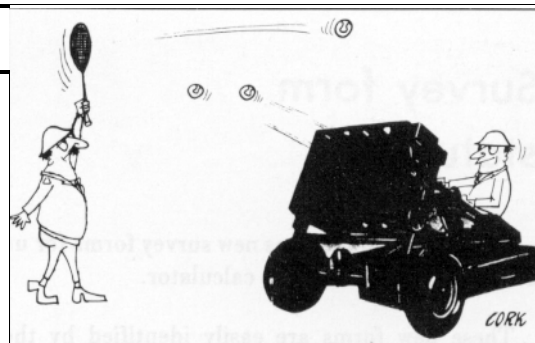
What is a slammer?

That is the question most people ask when the topic is mentioned. The only "Slammer" most have heard about is a term used to describe a jail. Our Slammer, however, is a lightweight multiple rocket launcher (MRL) system developed by the 101st Airborne Division Artillery in late 1975.

We, in the Air Assault Division, read the two-part article on MRLs in the *FA Journal* (November-December 1976 and January-February 1977) with great interest. The facts and figures presented on the Warsaw Pact Armies' capabilities and probable tactics, while no surprise, left little doubt that the US ground forces need more firepower. MRLs have been used in past wars, successfully, to deliver massive fires by both our NATO allies and possible future adversaries. The discussions presented on cost effectiveness, accuracy, and possible uses of an MRL system should further enhance the development and adoption of an MRL by the United States.

The 101st became involved in the development of an MRL for air assault/airborne/light infantry operations two years ago.

The construction of our first MRL prototype, nicknamed the XM477 Slammer, was accomplished by the 4th Battalion, 77th Field Artillery. Field artillery expertise and technical assistance was provided by the 2d Battalion, 320th Field Artillery. First, they determined what type of launcher they wanted and, looking around Fort Campbell and at their own assets, found that the M200, 19-tube pods for 2.75-inch rockets were readily available from the Division's many "Cobra" helicopters. Next, they had to choose a launcher transport vehicle. Since the transport vehicle had to be lightweight and air transportable both internally and externally by CH-47 helicopter, they decided to use the standard ¼-ton M151 truck. Spades were designed for the front and rear wheels to increase stability during firing. The problem of securing the launcher pods to the vehicle was solved by locally fabricating a mount, using



the hub and axle from a 1½-ton trailer from the post property disposal yard. Fire control was the next problem encountered. Again, using Division TOE assets, the M53 sight and M109 elbow telescope from an 81-mm mortar were selected to gain fire control.

The 101st Div Arty had something that looked like an MRL, but they had to devise a way to fire it and live through it. A remote firing system was developed in which the firing sequence was controlled by a standard 19-position helicopter intervalometer. Ignition power was provided by two standard 12-volt batteries.

This prototype was fired for the first time in October 1975 at Fort Campbell, KY. Successful tests and demonstrations were conducted by the 101st Div Arty in coordination with the project manager for the 2.75-inch rocket system. All firings were conducted using MK40 motors with high explosive, white phosphorous, illumination, and inert warheads. The maximum range achieved using MK40 motors was 7,000 meters. Newer developments will greatly increase this range.

Ammunition available for this system or ammunition under development includes that mentioned earlier, as well as chaff, flechette, submunitions, and day/night target designator warheads. The Slammer provided target coverage of an area approximately 150 by 250 meters.

This system is easily transportable, is highly mobile, and can fire further rocket loads from subsequent locations. Possible missions it could be assigned, but is not limited to, include:

- Area coverage.
- Artillery counterfire.
- Delivery of smoke, chaff, and other special-purpose munitions.
- Air defense suppression (of particular interest to the Air Assault Division).

Very little new hardware is required for this system. The major items required were available at Fort Campbell. With the use of the vehicles already in our inventory as the launcher transport, a relatively low-cost, reliable, multipurpose system can be fabricated.

A lightweight MRL system could easily be integrated into the air assault/airborne/light infantry concepts and could provide the extra firepower required to survive and win on the modern battlefield. ☒

CPT R. F. Parker Jr. is assigned to the 101st Airborne Division Artillery.



Training aid for gunners tested

A recent concept evaluation test was conducted by the Field Artillery Board to determine the potential of the Automated Firing Battery Trainer (AFBT) as a training aid or testing device for gunners and assistant gunners during fire missions.

AFBT equipment is capable of monitoring and recording commanded quadrant and deflection; quadrant and deflection set by gunner and assistant gunner; deflection level, cross level, and sight picture; and quadrant level and cross level. It also records the time between receipt of quadrant command by the crew and the time the gunner announces "ready."

The AFBT appears to be an excellent training aid because it provides direct feedback (procedures used and errors made) to gunners, assistant gunners, section chiefs or controllers. This equipment can be used to help teach inexperienced crews and sharpen the skills of those with experience.

With the AFBT, a commander is capable of training and testing gunners without firing a shot. The School is investigating the possibility of incorporating some of the capabilities of this equipment into the Battery Computer System.

Automated howitzer ready for test

Field Artillerymen looking for ways to reduce manpower requirements and increase responsiveness and accuracy of cannons have explored weapon automation from time to time. Past results have indicated that the added weight, complexity, and expense of automation exceeded the benefits to be gained.

The influence of new field artillery tactics, advancing technology, and ever scarcer manpower, again

raise questions of the desirability and affordability of weapon automation.

Automation, ranging from simple automatic fire command transmission to automatic traversing, elevating, cant compensating and sight tracking, is technically feasible; but is it tactically useful and cost effective?

Testing of an experimental M109A1 by the Field Artillery Board will begin this October with the objective of providing data to help decide the automation issue. The M109A1 which the Board tests will have automatic systems for transmitting data from FDC to the guns, displaying the data for the crewman, setting deflection and quadrant on the weapon, traversing and elevating the gun, compensating for cant, and sight tracking. These mechanisms can be activated selectively so that various possible levels of automation may be examined.

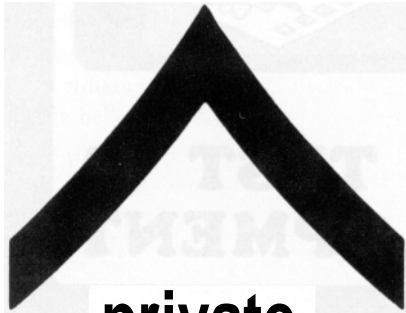
Nuclear trainer reviewed

The USAFAS recently conducted a user review and operational check on the XM754 nuclear training projectile. The XM754 is the trainer for the new improved 8-inch Artillery Fired Atomic Projectile, XM753, which represents current state-of-the-art technology in nuclear munitions. The goals of the XM753/754 are to: reduce maintenance requirements by approaching the "wooden round" concept; decrease response time by eliminating assembly procedures; increase effectiveness on the target, and to significantly simplify convoy operations. The new 8-inch nuclear projectile and its trainer will be fielded concurrently to replace the present M422/423.

Leadership talent

search:

by CPT Jeffrey A. Boucher



private

to



sergeant

A bright second-grader recently undertook the study of bears as part of a class project. Diligence rewarded the child with the information that bears are large furry creatures that growl; eat fish, berries, and honey; and sleep most of the winter. Placing this new knowledge in the context of her own experience, our young student arrived at the unshakable conclusion that her father was part bear. The child's mother professed complete agreement.

Leadership identification

Commanders frequently use a similar analysis process when selecting subordinates. We take the knowledge we've acquired about an individual or group of individuals, place that knowledge in the context of our own experience, and set about identifying leaders. Someone is usually around to agree with the commander's ideas. Unfortunately, our experience isn't always relevant to the requirements of the position we're trying to fill, and our knowledge is based on an environment which may be dissimilar to the environment our subordinate will be forced to cope with if selected for a leadership position. Consequently, a subordinate selected for a leadership position in this manner isn't necessarily equipped to handle his new job, just as the little girl's father would doubtless be a failure if forced to live with the bears. Both evaluations were made on the basis of questionable experience and environment. This is a particularly perplexing problem for the battery commander.

Extensive centralized evaluation systems exist for grades E7 through O-10 and compare favorably with civilian systems and performance requirements. However, before an individual can be considered for E7, he must hold grades E1 through E6. Unless someone identifies the young soldier as a leader and develops him accordingly, it's doubtful that he will ever be subjected to the complex senior evaluation system.

Leader identification in grades E1 through E5, is the

responsibility of battery commanders, the most junior of commanders. Personnel of lower grades are concentrated at the operative level and regulations specify that before an individual at this level can be promoted, he must have the approval of his commander. *Therefore, the least experienced commander is required to identify the vast majority of those soldiers who possess leadership talent and who will ultimately constitute the candidates for key NCO positions.* This situation can result in the following maladies:

- 1) Individuals who possess leadership talent go unrecognized, become discouraged, and leave the Army.
- 2) Individuals who do not possess leadership talent are erroneously identified and quickly fail, or survive in mediocrity for an unspecified period of time, largely through imitative behavior. These promotions cause diminished confidence in E4 through E6 leaders by both higher and lower grades and also contribute to NCO turnover, an increasingly serious problem as systems become more complex and training more expensive.
- 3) As individuals with leadership ability do emerge, formal and informal organization structures grow widely apart. This divergence is dysfunctional in many cases.
- 4) Erroneously identified junior NCOs are located at a position within the organization that must function absolutely correctly if the organization is to survive. *This organizational level, E3 through E6, is at the crunch-point between planning and doing and has the responsibility for turning planning and direction into physical acts.* Failure here is frequently irretrievable in the military sense.
- 5) Identification of individuals who have leadership abilities is frequently too late to allow optimum career development, thus reducing the quality of entrants into the E7 promotion system. These are only the major difficulties associated with leadership identification. Obviously,

organizational development cannot proceed with any expectation of goal achievement unless this problem is defeated.

Leadership identification model

Unhappily, while most officers would agree that leadership identification is critical, there exists a confusing collage of systems, methods, customs, and regulations confronting the small-unit commander. This collage changes slightly from command to command and is based in no small measure on time-in-grade and time-in-service. It is, therefore, necessary to set about the construction of a model which can be used and understood by the small-unit commander and which provides some expectation of success in excess of the effort required to put it to use.

The leadership identification (LID) model depicted in figure 1 is the successful evolutionary product of several years of trial-and-error. It is based, generally, on the following questions and answers:

- Question:** What are we really trying to select?
Answer: Effective small-unit combat leaders.
Question: What key common element do successful leaders exhibit?

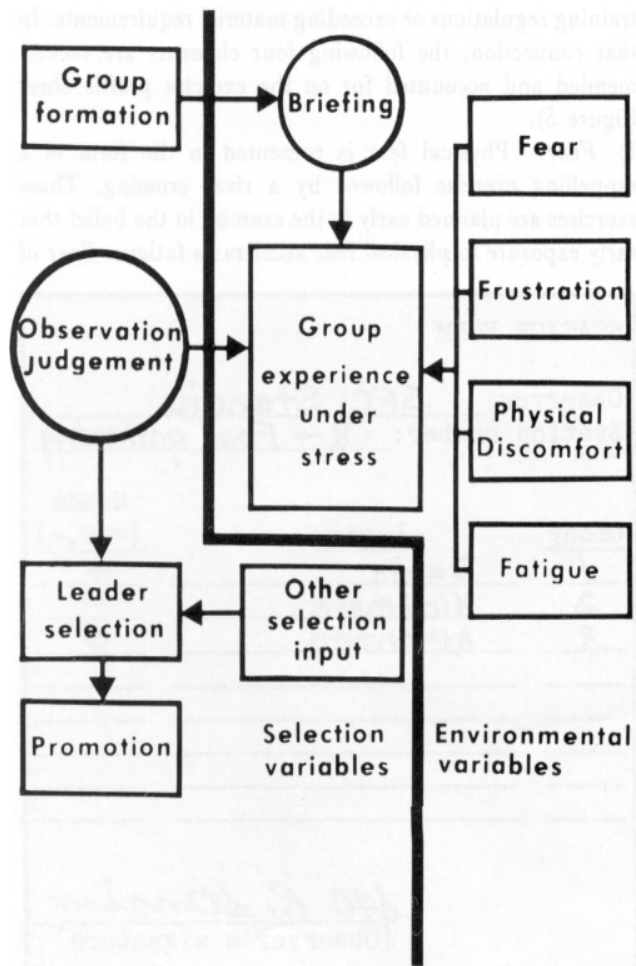


Figure 1. Leadership identification model.

Answer: The ability to provide effective combat leadership under stress.

Question: Can we duplicate combat stress as an exercise?

Answer: No. Impractical.

Question: Is it necessary to duplicate actual combat stress to identify the desired characteristics?

Answer: No. An approximation is possible and effective if it is carefully controlled and if the phenomenon of group selection is used to force leader behavior.

Armed with the answers to these questions, it is now possible to discuss how the LID model in figure 1 works. (Note that the model is divided into two sections, one of selection variables and one of environmental variables.)

Selection variables

Group formation: Each enlisted man is designated a leadership candidate as early as possible in his career. He must be integrated into an exercise as soon as possible after he is assigned to a tactical unit. Before going to the group formation site, each candidate is stripped of all rank and insignia and advised that all members of the group are the same grade for the purpose of this exercise. This is necessary to prevent position-power from being introduced into the exercise environment. Such power will bias the group interaction. Personnel remain standing in a specified area for at least two hours to allow spontaneous groups to form. After observing the groups, the commander forms candidate groups of four or six men from different spontaneous groups. An even number is essential to discourage the practice of voting on leadership issues. Candidate groups are isolated and given a briefing sheet.

Briefing: The exercise briefing sheet (figure 2) is utilized to satisfy various administrative requirements and to plant a seed of apprehension in the mind of each candidate. Additionally, the briefing suggests that the exercise can be completed in four hours, when in fact 24 hours are required regardless of group performance.

Observation/judgment: Groups are given 15 minutes to rest between exercises. During this period, they are furnished a printed decision sheet relative to the next exercise. Observation of a group's performance at each station of the exercise is undertaken by an NCOIC (E7 through E9) who is selected on the basis of demonstrated, long-term leadership ability. These NCOs are instructed to say nothing, do nothing — make no reaction to the group of any kind. Any observer reaction may reinforce the leader then in power and thus inhibit the ability of the group to select its own leader. Each NCOIC fills out a station form (figure 3) which requires that he identify the group leader at that station, or state "no leader," and grade the leaders performance +, 0, or —. For example, one individual gained the leadership of a group early in an exercise and promptly led them over a

1. This exercise is designed to give you confidence in your soldier skills.
 2. The duration of this exercise depends on how well you perform. No matter what situation you find yourself in, you must complete the exercise and you must stay with your group. The exercise will take from 4 to 24 hours.
 3. Do not cross any hard-surface roads. Do not touch duds or ammunition items. Do not cross white engineer tape. Engineer tape encircles dangerous areas. If you observe a red flare (day) proceed in the direction of the flare. If you observe a white searchlight (night) proceed in the direction of the light. (Adapt to local safety ground rules.)
 4. NCOs on the course are there for administrative purposes only and will *not assist you with the problems you will encounter*. If a member of your group is injured, contact the nearest NCO and call for assistance on the radio you have been issued. Perform a communications check at this time.
 5. You are authorized to break radio silence only if there is an emergency.
 6. Please be extremely careful. Injuries during this exercise are very common but totally unnecessary if you remember your training.
 7. GOOD LUCK!
- Figure 2. Exercise briefing sheet.**

fence to a local bar where they remained until located by a controller. Clearly this man was exhibiting leadership ability, but he would get a minus grade because he wasn't sufficiently objective-oriented to fill a combat leader's role. The NCOIC grading our AWOL soldier-leader was unable to discuss objective orientation, but knew that a successful leader would not behave in such a manner and graded the AWOL leader minus.

Leader selection: After the exercise, the commander combines station forms into a profile form (figure 4) which provides him with a profile of each group's leadership pattern. Based on this pattern, the commander subjectively determines whether any individual in the group has demonstrated sufficient leadership ability to have established himself as the dominant group leader. If so, the commander, in concert with key unit NCOs, considers other selection input such as demonstrated success, test scores, self-confidence, military bearing, and ability to communicate. He lists identified individuals in order of his perception of desirability. When promotions are available, the commander simply promotes from the top of his list. Leadership candidates are not advised of the outcome or purpose of the drill. Ideally, initial selections in the E2 through E4 grades will not relate to time-in-service or time-in-grade.

Environmental variables

An unstructured group is a group that has no designated command chain, and thus no position-power leaders. Deliberate, conscious efforts to place an unstructured group

under stress constitute the leadership identification drill and this drives the model. In fact, this drill is the only aspect of the model that distinguishes it from various civilian and military techniques.

Stress causes physiological changes that enhance the ability to fight — not necessarily the ability to think. The small-unit commander is looking for someone who can do both. Also, there is considerable evidence to indicate that unstructured groups under stress search for an authority figure to provide order and security. Before an unstructured group can be placed under stress, it is necessary to define what constitutes the sort of stress that would be useful in simulating, even to a slight degree, actual combat stress.

Research done during WWI, WWII, Korea, and Vietnam for the most part ignores the fact that each of those conflicts was fought by soldiers who were very different in sophistication, educational background, philosophy, tolerances, etc. Thus, previous research, while helpful, is of doubtful value for our purposes and in some instances actually confusing. Alignment of desired stress elements with training restrictions poses serious problems. Accordingly, it is necessary to select elements that appear consistently throughout all of the previously described research and which can be reproduced without violating training regulations or exceeding materiel requirements. In that connection, the following four elements are recommended and accounted for on the exercise profile sheet (figure 5).

1) **Fear:** Physical fear is presented in the form of a rappelling exercise followed by a river crossing. These exercises are planned early in the exercise in the belief that early exposure to physical fear accelerates fatigue. Fear of

STATION FORM

Observer: SFC Stanciu
 Station number: 8 - Food gathering

Group	Leader	Grade (+, 0, -)
<u>1</u>	<u>Davis</u>	<u>+</u>
<u>2</u>	<u>Hindmore</u>	<u>-</u>
<u>3</u>	<u>Attenton</u>	<u>0</u>

SFC R. Stanciu
 (Observer's signature)

Figure 3. Station form.

LEADERSHIP PROFILE FORM

Group: 1

Station	Leader	Grade (+,0,-)
1	Smith	+
2	Smith	-
3	Jones	-
4	King	+
5	Davis	+
6	King	-
7	Davis	+
8	Davis	0
9	Davis	+
10	Davis	+

Identified leader: Davis
 Leader candidate: Yes
 Group members:
Adams, T. L.
Davis, M. N.
Smith, C. J.
Jones, K. L.
King, A. A.
Baker, M. P.

Figure 4. Leadership profile form.

failure, coincident with stress failure in many cases, is a peer-oriented fear and is present throughout LID. Suggestion of danger designed to trigger fear is contained in the briefing.

2) **Frustration:** Incompatible demands, both internal and external, and continued failure are presented by a helicopter ride for which there is no helicopter and by a vehicle that won't respond to maintenance. Stations 4, 8, and 9 of the exercise also contribute to this element. Frustration must be maintained for the duration of the exercise to be an effective stress element. Lack of response from observing NCOICs on the course is also a source of frustration.

3) **Physical discomfort:** Providing food totaling 800 calories per man per day to a soldier who is accustomed to considerably more is a source of physical discomfort. Lack of sleep and weather factors also contribute. Fatigue is a source of discomfort, but is dealt with as a single element.

4) **Fatigue:** The distance from Station 1 to Station 10 is just over 17 miles. The entire course must be negotiated on foot, part of it at a run. The rappelling exercise and helicopter station at the early part of the exercise are exhausting in themselves, partly for emotional reasons.

The combination of these four elements places an unstructured group under sufficient stress to force leadership behavior, and that behavior can be recognized, recorded, and used in a selection process via the LID model. It is extremely important to note that the exercise does not identify leaders — it only identifies leadership behavior. This distinction is essential because observations are confined to isolated occurrences under carefully contrived conditions. Thus, while it is possible to say that Davis exhibited the dominant leadership behavior in his group, it is not possible to say that Davis is a better leader than Smith, who was in another group and did not exhibit dominant leadership behavior. Nor does the selection of Davis mean that he will exhibit similar behavior at any time or under any circumstances in the future. It is only possible to conclude that at a certain time, under some indefinite amount of stress, Davis exhibited leadership behavior that was judged by a successful selection medium to be militarily effective. Thus, "other selection input" is a necessary element of the model to attempt to determine if the exhibited behavior is consistent with the behavioral pattern of the individual concerned. In other words, it isn't necessary to promote a "dud" just because he happened to emerge from this test as the leader of a group of duds. As limited as this information seems, it's considerably more than we're using now in terms of behavioral characteristics exhibited in a military environment. This additional input to leader selection is infinitely more valuable than the recommendation of a marginal NCO to promote a soldier who excelled at garrison bed-making.

Station	Activity	Distance In Miles	Station NCOIC	Remarks
1	Route selection	NA	Dennis	All point-to-point routes are the same.
2	Rappelling	2.6	Committee	Rappelling/river crossing.
3	Copter pickup	0.6	Stanciu	No copter.
4	Rifle firing	1.8	Anderson	6 tgts, 19 secs.
5	Route selection	1.2	Henderson	
6	Transport	0.5	Dennis	Jeep won't start.
7	Route selection	4.0	Clark	
8	Food gathering	3.0	Stanciu	1/5 amount.
9	Communications	3.0	Anderson	Radio won't work.
10	Route selection	0.3	Henderson	Pick up and debrief.

Figure 5. Exercise profile sheet.

Objections

I can already hear some "standard" objections and questions coming my way. To forestall at least some questions, the following comments are made.

Although there are noncombat MOS jobs at the battery level, in my view, all jobs at this level are combat-related. The requirement for combat leadership extends to all skills that may find field combat use, including mechanics, wiremen, cooks, and even clerks. A cook isn't someone who can prepare food; he is someone who is capable of preparing food under field or garrison conditions and under a full range of tactical conditions that can be expected to produce fear, frustration, physical discomfort, and fatigue.

The commander can use observations of the cook's performance in the mess hall as an additional input to his decision-making process, perhaps requiring less of LID, but not ignoring the fact that leadership is required in the mess hall as well as "on the guns."

With resource limitations a constant factor, performance of LID might seem impractical. This is not the case. A battery commander finds the resources by using installation facilities that are available to him, and by applying his creativity. Various forms of LID were used in my commands at Fort Huachuca, Fort Lewis, and Fort Sill. Prior planning has been the major drawback in the past because a considerable chunk of terrain is required and because some range and facility coordination is necessary. In reality, I guess the real problem here is whether or not the commander knows what he's doing. If he does, resource problems can be solved.

Time, a special subject, is always proclaimed to be the bane of every battery commander's existence. In truth, we battery commanders don't use time very well. Decentralized battery training has, at worst, taken a battalion from doing all things together to three batteries doing all things together — hardly an improvement.

My concept (I call it the "4-1 concept") is that a battery should be able to accomplish its routine mission in four days, and Friday, *every* Friday, should be commander's *day*. Field training has priority over everything else, but, even in the field, Friday can be commander's day. If you look in terms of time study at the waste in the weekly activities of an artillery battery, you will find a lot of SAT (standing around time). The use of a technique called incremental battery scheduling may help. Incremental battery scheduling does many things for a commander, but mainly it reduces SAT.

What does a commander do with a full day each week? Some of our commanders have trouble filling an hour

each week. Activities are planned six weeks in advance and announced one day prior. The suspense is useful in breaking up the boredom that unfortunately characterizes quite a few batteries. Activities are divided into three categories and can be undertaken as required in the perception of the commander, but normally are full, or at least half-day activities.

- Soldier skills include: LID, physical training, marksmanship, orienting, map reading, CBR, and inspections.
- Permissive exercises include: classes, lectures and films (required and desired), security processing, shots, administrative activity, unit parties, ecology/community projects, and days off.

Missions conflict, schedules change, generals want parades, and so-on. Commanding anything isn't a precise, finite exercise, and young commanders need to realize that. A battery changes form and function in response to the environment around it. Of course, if fewer colonels were frustrated battery commanders and if more staff people were battery-oriented, these changes might be better oriented. Give that young captain the job, if he fails, fire his tail, but make sure he knows the rules.

In short, time for LID — and for other things we should be doing — is here. We *have* it — we're just not using it.

Battery/battalion utilization

The LID is intended to be an addition to, rather than a replacement for, existing selection processes. Special performance evaluations of leaders selected via this system should be conducted at 30-, 60-, and 90-day intervals after promotion to verify the results of the selection process and weed out errors. As the commander gains more confidence in the model, he may wish to modify his selection procedure to give the LID model more weight.

In any case, utilization of the LID model must be confined to battery or battalion level. The commander who has promotion authority must be intimately involved with the conduct of the exercise, must have confidence in the NCOICs he's using as a selection medium and must personally evaluate the results. Any other alternative to battery/battalion utilization robs the commander of the confidence he needs to allow the model to work. The commander, as always, is responsible from first to last. ☒

CPT Jeffrey A. Boucher is assigned to The United States Logistics Group, Detachment 67, APO NY.

REDLEG Newsletter

FAOAC 78-1

Field Artillery Branch is presently placing officers on orders to the Field Artillery Officer Advanced Course 78-1 which starts on 19 March 1978. Those officers in the grade of captain, or lieutenants who are expected to make captain during the advanced course, will be considered.

Current assignment stability policies must be evaluated in selecting officers for the course. This means that present tours of duty must be completed by approximately 14 February 1978. In rare cases, exceptions are granted for tour curtailments to attend the course.

News for FA majors

Many of you have expressed an interest in knowing what overseas duty areas are available to majors. AR 614-30 contains a listing of these areas. Majors due an overseas long tour in Field Artillery can expect assignments to Europe, Alaska, Hawaii, Panama, and occasionally Italy. Those due short tours can be sent to Korea, Iran, Saudi Arabia, Turkey, Greece, and Palestine. The majority of long-tour requirements are in Europe, and Korea heads the list for short-tour requirements.

There are opportunities for assignment in your alternate specialty to other areas listed in AR 614-30. Assignment options to these areas should be coordinated with your alternate specialty manager. Major Bacheldor or Siraco, AUTOVON 221-0686/0687, or commercial 202-325-0686/0687.)

Warrant officers

Radar WO: 211A A shortfall of warrant officers is anticipated for year ending September 1977 in MOS 211A. Shortage results from the low number of qualified applicants applying, coupled with an increase in the authorized "end strength." An excellent opportunity now exists for the persons qualified in field artillery radar

maintenance for appointment and call to active duty as a warrant officer. Commanders and supervisors should encourage those considered qualified in FA radar maintenance to apply for WO. (See AR 135-100.)

Pershing WO: 214E The CONUS turn-around-time remains the same: 16 to 18 months. All pinpoint assignments are made by the USAREUR assignment officer. Applications for appointment to 214E are encouraged.

Redleg Airborne-Rangers

FA Branch has a continuing need to assign one captain and three first lieutenants to the 2d Battalion, 75th Rangers at Fort Lewis, WA, and to the 1st Battalion, 75th Rangers at Fort Stewart, GA. These eight assignments are considered among the most challenging and demanding tours for a field artilleryman, and only the best-qualified are selected. To be considered, you must be airborne and ranger qualified, possess an above average manner of performance, and be well grounded in FA tactics and techniques. Captains should have commanded and lieutenants should have served as battery officers. (DAPC-OPE-F, 200 Stovall Street, Alexandria, VA 22332; AUTOVON 221-7817/0187.)

Airborne and Ranger vacancies announced

Vacancies exist in a large number of MOSs for Airborne and Ranger units according to the Department of the Army. Applications for Airborne or Ranger units can be submitted after checking with unit personnel clerks to determine if all qualifications can be met.

Soldiers whose enlistment options result in a stabilized assignment are not eligible to apply until the end of the stabilized tour unless they submit a waiver with the application. Soldiers who dropped out of Airborne training or left an Airborne unit at their request for other than hardship or compassionate reasons are not eligible.

Redleg Newsletter

Artillery MOS vacancies for Airborne by grade are:

E8 and E9 — 13W and 13Y.

E7 — 17B, 17C, and 93F.

E6 — 17B, 17C, 82C, and 93F.

E5 — 13E, 17B, 17C, and 82C.

E3 and E4 — 13B, 17B, and 17C.

Artillery MOS vacancies for Rangers by grade are:

E5 — 13E.

E1 through E4 — 13B.

Alternate specialty designation

The alternate specialty designation process for basic year group 1971 will begin in October. Each officer in this year group will receive a specialty packet during October explaining the procedures and citing appropriate references that should be reviewed for those alternate specialties available for the Field Artillery officer.

In this packet is a specialty preference form to be completed, and the officer should indicate, in priority, four specialties he is interested in. One of these specialties will be designated as the officer's alternate specialty and he will be notified of this in April 1978.

The preference form is to be returned no later than January 1978; otherwise, MILPERCEN will have no idea of what the officer wants as an alternate specialty. This is important! When the information packet arrives, read it and follow through! (MAJ Richard F. Timmons, 200 Stovall Street, ATTN: DAPC-OPE-P, Alexandria, VA 22332 or call AUTOVON 221-7818/7819)

Alternate specialty assignments

OPMS is in full swing and your alternate specialty needs your attention. Majors are being assigned with full consideration toward their progressive development and use in an alternate specialty. Promotion boards are evaluating officers based on performance in **all** duty positions; therefore, you should recognize the importance of being fully qualified.

Before you are reassigned, your management file is reviewed by the Professional Development Officer, who checks the "request for orders" to verify that you are being career-developed in your assigned specialties. Generally, this means you can expect assignments which maintain your qualification, education, and experience in two specialties. We all must remember that Army requirements are the primary factor in determining assignments. Personal competence and desires are considered as part of the

management process, with a view toward filling each job with a qualified officer.

Professional development planning and evaluation guidance is available in DA Pamphlet 600-3. (Major Pete Swenson, ATTN: DAPC-OPM-P, AUTOVON 221-8104/5/6.)

Officer development

The target date for distribution to the field for the new Department of the Army Pamphlet 600-3, **Officer Professional Development and Utilization**, is the end of September 1977. If you don't have one — get one. This pamphlet is the "Bible" for the professional development of the officer corps. It presents the philosophy and management practices of the Officer Personnel Management System (OPMS) and discusses each of the OPMS specialties.

Advanced civil schooling — FY 78

Selection for graduate study is designed to meet specific Army requirements in predetermined disciplines. Prerequisites for selection are an outstanding performance record, primary specialty qualification, and an academic record which will support an officer's designated (or anticipated) specialties.

Undergraduate schooling (degree completion program) is available to officers with records that support promotion and retainability who can complete degrees in 18 months or less and are available for reassignment. Consideration is generally limited to those officers who have completed the Officer Advanced Course and can earn degrees in 12 months or less.

Selected officers are required to serve a three-year utilization tour immediately after graduation. Civil schooling applications (see AR 621-1) are accepted at any time and remain active in your career management individual file until you are selected, notified of nonselection, or otherwise become ineligible.

All officers interested in graduate schooling should contact their management division (Major Bryan, AUTOVON 221-7818/7819) before submitting an application.

Company Grade, Combat Arms Division, has 83 openings in the following disciplines for fully-funded advanced civil schooling during FY 78.

Aeronautical engineering.
Area studies.
Automatic data processing.
Comptrollership.
Electronics engineering.

Guided missile engineering.
Journalism.
Nuclear physics.
ORSA.

Combat Arms Division has a total of 95 openings for officers to enter graduate school for the purpose of obtaining a masters degree in the following fields, and remaining at the institution for a three-year tour as an ROTC instructor. If interested, apply under the provisions of AR 621-101.

ADPS business.
ADPS engineering.
Aeronautical engineering.
Applied psychology.
Area studies.
Auditing/accounting.
Chemical engineering.
Civil engineering.
Clinical psychology.
Communications engineering.
Comptrollership.
Criminology/corrections.
Education (audio-visual aids).
Electronics engineering.
Experimental psychology.
Geodetic science.

Guided missile engineering.
Hotel and restaurant management.
Industrial psychology.
Journalism.
Logistics management.
Motion picture production.
Nuclear effects engineering.
Nuclear physics.
ORSA, business.
ORSA, engineering.
Petroleum engineering.
Physics engineering.
Physics, optics.
Procurement and contract management.
Safety.
Topography-photo.

Centralizing security clearances

DA officials have announced plans to consolidate all security clearance activities under MILPERCEN.

MILPERCEN is scheduled to open the new Central Clearance Facility (CCF) at Ford Meade, MD, on 1 October, 1977. The CCF will decide whether security clearances or access eligibility should be granted, denied, suspended, or revoked, based on available investigative data for Army military and civilian personnel.

Local commanders will no longer make the determination for security clearances but will continue to control access to classified defense information based on the recommendation of the CCF.

Officials said by centralizing the decision-making process for security clearances it will standardize the basis for access to classified information Army-wide. In addition, as the system becomes fully operational, it will be able to monitor and track the status of personnel clearances so that they can keep pace with personnel assignments. This will help eliminate the period when a soldier cannot do his job while waiting for his clearance to catch up with his assignment.

Attending Infantry or Armor Advanced Course

The Field Artillery Branch has a reciprocal agreement with the Infantry and Armor branches to include several outstanding Field Artillery officers in the IOAC or AOAC classes each year. They, in turn, select officers to attend the FAOAC.

Usually, the artilleryman selected to represent our branch at Fort Knox or Fort Benning is a captain, well grounded in his primary specialty, who has successfully commanded a battery, although others may be considered. (MAJ Glen Skirvin, MILPERCEN, ATTN: DAPC-OPE-F, 200 Stovall Street, Alexandria, VA 22332, or call AUTOVON 221-7817/0187)

Your files

FA officers, we encourage you to review your official file on a regular basis — we recommend every three years or, as a minimum, six to nine months prior to any board action that may affect you. Appointments to review your official file must be made 72 hours in advance, by calling AUTOVON 221-9618/9619 or commercial 202-325-9618/9619.

An alternative to the expensive trip to Washington just to review your official file is available. Official files are being converted to microfiche, and you can request a copy of your file simply by writing MILPERCEN, DAPC-PSR-S, 200 Stovall Street, Alexandria, VA, 22332. Be sure to include your full name and SSAN in the request. The first fiche will cost \$2 and each additional sheet will cost \$.05.

OPMS support asked

Field commanders throughout the Army have been asked to assist in the professional development of the officer corps. The request, contained in a recent message from Commander, MILPERCEN, said that commanders at all levels should be familiar with DA Pamphlet 600-3, Officer Professional Development and Utilization, and should emphasize the development of young officers in their primary specialties.

The message also said that civilian education or other experience should not be the basis for assignment of young lieutenants to jobs in other than their primary specialty and that a lieutenant on a three-year tour of duty should serve in two related duties if feasible.

Officer education is an ongoing process, according to the message, and is not limited to formal schools. Officers assigned to a new duty seldom have all the expertise required and Army leaders should assist in their training.

Let's Take Another Look...

GS In The Defense

by MAJ William R. Calhoun Jr.

A very fine article in the September-October 1975 *Journal*, "Artillery Support in the Yom Kippur War," described some lessons the Israelis learned in that war. First, artillery can defeat tanks. As stated by the author, Brigadier T. L. Morony:

They (the Israelis) have, however, found that what we used to call medium guns — that is, the 130-mm and upwards — are effective and moreover that they are effective against tanks. Three regiments of 155-mm guns [36 guns] not only can stop tanks but did stop a battalion of tanks on several occasions. A concentration by 36 guns of about 10 rounds [each] fired as fast as possible is effective.

A second lesson the Israelis learned in the war, which is related directly to the armor-stopping effect of massed artillery fires, was that artillery was better employed in general support (GS) than in direct support (DS). An editorial comment following Brigadier Morony's article took vigorous doctrinal exception to this Israeli "lesson learned," stating in the process that ". . . DS must . . . always be *the* priority mission of the artillery supporting a maneuver force." The tone of the comment gave readers an impression that the US Field Artillery community was unwilling even to look at any different tactical conceptions. Perhaps we should.

Specifically, in the defensive situation which prevails in Europe, we should consider retaining our divisional DS-configured battalions in general support of the division.

Four advantages would accrue to this change of missions:

- We could adopt a "systems approach" to the battlefield.
- Centralized control would add to the security of divisional artillery battalions.
- We could oppose Soviet mass with mass.
- The potential for concentration inherent in this proposal would be more consistent with the recently promulgated principles of the active defense.

Assignment of the GS mission entails changing the seven inherent fire support responsibilities. Four of the standard GS responsibilities (priorities of fires, zone of fire, positioning, and fire planning) could be assigned to DS-configured

battalions without modification. The other three inherent GS responsibilities (furnishing FOs, establishing liaison, and establishing communications) would be modified to take advantage of the personnel and equipment available in the DS-configured battalions. DS-configured battalions used in a GS mission would furnish observers, effect liaison, and establish communications as directed by division artillery headquarters.

It is visualized that FO teams would be furnished routinely on a basis of two teams per maneuver battalion or a total of 18 to 20 teams per division. The rationale for this employment will be discussed later. Assigning FOs in this fashion would allow for the creation of a residual pool of 10 to 13 FO parties which would be controlled from division artillery headquarters. These observers would normally be used as aerial observers, using division artillery organic aircraft, air cavalry troop aircraft, or aviation battalion aircraft. A detailed plan of aerial observation would be used to achieve thorough coverage of the battle area. Moreover, aerial observers could be assigned missions to hunt and destroy specific types of targets such as air defense weapons, electronic warfare (EW) transmitters, or nuclear delivery means. During these aerial missions, flying techniques similar to those of TOW-armed helicopters would be used. Other observers from the division artillery pool could support division or corps armored cavalry units, long-range reconnaissance patrols, or combat engineer battalions. If an engaged maneuver unit needs more observation parties than it has, FOs from the division artillery would reinforce that unit. Perhaps 10 or more FOs could be supporting one maneuver battalion if the situation warranted. As the observation requirement with one unit diminishes, the FO party would be reassigned to another unit. No FO party would remain unassigned or with a unit in reserve, though these units would keep their artillery liaison officers. Ground and aerial observers would be assigned a specific battalion to which to send calls for fire; division artillery headquarters would inform each battalion which observers were acquiring targets for it and would monitor transmissions from aerial observers. The information provided by these aerial observers would allow the division artillery commander to maneuver the artillery at his disposal to place maximum fire on the enemy. The division artillery would function as an agile, massive linebacker.

This centralized control of observers, particularly AOs, plus the power to assign priorities of fire to all units, would allow the div arty commander to take a systems approach to the battlefield.

Through programs of fires and aggressive hunting by aerial observers, div arty can inflict extensive, perhaps irreparable, damage on enemy subsystems. Examples of the latter would be his air defense, communications systems, EW equipment, chemical or nuclear delivery means, antitank weapons, tanks, etc. A subsystem would be pursued until the desired level of damage was attained, thereafter giving us a decided battlefield advantage in that functional area. This could be quite important. For instance, destroying the enemy's air defense weapons would allow our tactical air support and attack helicopters more freedom of action, enabling them to exercise their considerable capabilities to help stop an enemy break-through attempt. This will be increasingly true as the A-10 aircraft comes into the US Air Force inventory.

A relatively slow, heavily-armed aircraft, the A-10 is intended to be a tank-killer, but unless we can destroy a significant portion of the enemy's awesome air defense, we will probably suffer prohibitive A-10 losses.

The Israelis in 1973 found that, even with high-performance aircraft, they suffered nearly intolerable losses to Egyptian and Syrian air defense weapons, losing 50 aircraft in the first three days. Unless we selectively destroy enemy air defense systems, we will not be able to use our aerial assets to maximum advantage. The same applies to using other of our assets without a determined program to neutralize enemy countersystems.

Because of its destructiveness and all-weather capability, field artillery is the most logical weapons system to initiate a systems approach to land warfare. This will be even more true as laser guided projectiles become available, assuring destruction of point targets. The centralization, particularly assignments of observers and priorities of fire, inherent in the GS mission is absolutely essential to implement such a reasoned, methodical system.

A second basic reason to employ divisional artillery battalions in GS rather than in DS is to increase their security. When battalions are employed in DS, their positioning is relatively stereotyped. Too often they are centered on the supported unit and, in a defensive situation, 10 to 12 kilometers behind the FEBA. A good map inspection and a knowledge of our defensive artillery tactics would give an enemy artillery intelligence officer a high assurance of finding each of a division's three DS

battalions. Once found, these battalions are subject to destruction or neutralization by fire or to impaired effectiveness by EW. As nuclear delivery means, field artillery units are subject to specific, concentrated attempts to destroy them. Indeed, Soviet offensive doctrine makes the destruction of nuclear delivery means a high priority task. As stated by A. A. Sidorenko, in his book *The Offensive (A Soviet View)*:

. . . each artillery piece capable of employing nuclear ammunition will be destroyed immediately after its detection to prevent them from launching nuclear strikes.

An alternative to our current stereotyped positioning of DS units would be to reposition artillery battalions several times each day at irregular hours according to a centralized plan. Battalions could be positioned almost anywhere in the division area from very close to the FEBA to very far behind it, and from the division's left boundry to its right. We would maintain a requirement, however, that every portion of the division's sector of the FEBA could be covered by at least one artillery battalion. This could very well entail a battalion positioned far forward, firing diagonally across the division area to support a flank brigade. Such repositioning of division artillery battalions would be appropriate during the initial onslaught or in any relatively stabilized defensive situation.

Not only would frequent, irregular movement reduce the vulnerability of field artillery battalions to enemy firepower and EW, but it would also make the enemy's planning for airborne or air assault operations in the division area far more difficult.

Vulnerability during moves could be reduced by having the firing elements move cross-country insofar as possible and the wheeled elements infiltrate in small groups to the new position. "Stunting" our defense in this manner would enable us to gain an added measure of protection for our artillery battalions and would thereby increase the assurance that we could respond effectively with either conventional or nuclear munitions; the GS mission is the tool which would allow centralized maneuver of the division's field artillery battalions.

Third, our adversary's tactics make it necessary to adopt a doctrine which will allow us to concentrate all of our artillery on a small, critical area. Though Soviet offensive

theory appears to be taking some notice of the need to disperse in a nuclear environment, they continue to place great reliance on the breakthrough tactics developed during World War II. A huge preponderance of combined arms power is concentrated on very narrow, widely separated sectors of the front, with the idea of conducting multiple double envelopments after the initial penetrations are made.

An historical example may be found in an offensive operation conducted by the 1st Ukrainian Front in July 1944. The width of the breakthrough sector was 26 kilometers in an offensive zone 440 kilometers wide. In this 6 percent of the real estate, the 1st Ukrainian Front concentrated 68 percent of its rifle divisions (46), 80 percent of its tanks and assault guns (1746), 65 percent of its other guns and mortars (7350), and all of its 5346 aircraft. This concentration allowed the Soviet forces to achieve a 5 to 1 advantage in personnel, an 8 or 9 to 1 advantage in artillery, and a 3 or 4 to 1 advantage in tanks and assault guns. Throughout World War II the breakthrough densities achieved by the Red Army grew larger and larger. By 1944-45, the Soviet Army's density *per kilometer* of front in breakthrough sectors was: 6 to 8 infantry battalions; 250 to 300 mortars and artillery weapons; 20 to 30 tanks; and 3.5 to 6 engineer companies. Breakthroughs were generally attempted in the most vulnerable defensive sectors — normally boundaries between units or lightly defended flanks.

To counter this tremendous mass of combat power, we must be able to mass our own combat power rapidly and effectively. Most important in this concentration of combat power is our firepower. As indicated by BG Albert B. Akers in his article, "Firepower," in the May-June 1976 *FA Journal*, we must be able to apply massive doses of firepower against the advancing enemy. Such firepower is effective against any type force that could attack us, including tanks, as indicated by reports from the Yom Kippur War. With our massed artillery slowing or stopping Soviet tank battalions in the forefront of the breakthrough, we can seriously reduce the probability of enemy success.

A sufficient concentration of firepower is possible only through the positioning of artillery battalions. We need to move every available artillery unit to engage the enemy's breakthrough attempt, including those normally in direct support. Positioned as they currently are to provide direct support to a center or flank brigade, they will be unable to deliver effective fire on a flank breakthrough sector. Assignment of a GS mission to all divisional artillery battalions is the way to achieve the most rapid and effective concentration of our firepower.

Some will object that we are perhaps leaving maneuver units with insufficient fire support. The previously cited editorial comment in the September-October 1975 *FA Journal* expressed this concern in the following fashion:

On the modern battlefield, the battle will be won or lost at the brigade level — a fact which dictates that a maneuver brigade *must always* have immediately responsive field artillery support in the form of the DS mission.

Despite the obvious conviction of this statement, its major premise is most likely incorrect. *One* of the division's three brigades (generally one on a flank) will probably bear the brunt of the attempted breakthrough, and the division's battle will be won or lost in this sector. Consequently, the maximum available fire support must be provided immediately to the brigade trying to keep the division from being penetrated. An economy of firepower operation will have to be conducted in the sectors of the other two brigades as we mass our firepower in support of the brigade holding the breakthrough zone. To hold an artillery battalion behind a maneuver unit other than one holding the breakthrough sector would be like holding a linebacker behind the right side of the defensive line when an opposing runner is coming through the left side. It may be argued correctly that if one brigade of a division is experiencing a crushing attack, the other maneuver units will be thrown into the battle in the attacked brigade's sector. No doubt this would happen, but it would probably take time, both in making decisions and in carrying them out. Field artillery can be displaced much more rapidly, as it would not generally have to withdraw from combat under small arms fire, make a passage of lines, occupy positions on or near the line-of-contact, or do any number of other things a maneuver unit would likely have to do.

We should take advantage of the responsiveness of our artillery and not pin it down with a DS mission until a maneuver unit moves. To continue the football analogy, holding a field artillery battalion in DS until a supported maneuver unit moved would be like holding your linebacker in position until the defensive linemen in front of him began their pursuit. To respond to the enemy's tactics, we need to take advantage of our artillery's mobility, rather than doctrinally reducing this capability.

Finally, the assignment of a GS mission to divisional artillery battalions is more consistent with the defensive tactics for maneuver units promulgated in FM 100-5, dated 1 July 1976. The defensive zone is divided into a covering force area and a main battle area. Relatively strong forces are to be employed as covering forces to enable them to

fight strongly enough to make the enemy tip his hand regarding the size and direction of his main attack and to gain time for the commander to concentrate the main battle area forces to oppose the enemy's breakthrough attempt. Two other covering force tasks are to strip the enemy of his air defense and to deceive him as to the location and strength of friendly forces. Corps and division cavalry units, suitably reinforced, will generally conduct the covering force mission. Maximum artillery support will be required to enable these forces to accomplish their missions. It is conceivable that most division field artillery units initially will be positioned within the covering force area to engage the enemy at the forward edge of that area and that each unit in the covering force will be provided FOs from the division artillery. Achieving a heavy concentration of firepower in the covering force area offers perhaps our best chance to force the enemy to deploy and thereby disclose his intentions.

Positioning divisional artillery in the covering force area would have three other benefits.

- It would facilitate counterfire, as it would decrease the Soviet artillery's range advantage if it is positioned far enough forward to attack our main battle area.
- Forward-positioned field artillery and centrally-directed AOs would likely carry a lion's share of the responsibility of destroying the enemy's air defense umbrella.
- Such positioning would also be a very effective deceptive measure, as the enemy could not count on the traditional equation (one 155-mm SP battalion equals one maneuver brigade) to locate maneuver units.

Providing such artillery support to a covering force requires positive, centralized control to minimize the possibility of losing artillery battalions. This is best done by assigning a GS mission to each of the artillery battalions in the covering force area and having them positioned by the division artillery commander. The div arty commander, having immediate access to the division's organic and attached target acquisition and intelligence assets and concentrating on the effectiveness and safety of the field artillery, can best take responsibility for this positioning. He can also effect the most orderly and effective shift of fire support units into the main battle area, as battalions move back without any change in who controls them.

When the division is defending the main battle area, FM 100-5 tells us that both maneuver and combat support units will be tightly concentrated to allow the enemy to gain no more than a 3 to 1 advantage in combat power at the decisive point. We will begin fighting the battle as far forward as possible. In the area of the main attack, the

defensive battle will be fought on a battalion-centralized basis, often with a battalion in one battle position. If a key piece of terrain must be held, a battalion strongpoint, designed to withstand a direct assault, will be created. In the main, however, the defense will be elastic, stretching and giving, but not breaking. In this battalion-fought battle, fewer FOs will be required than were needed when battles were primarily fought at company level. The proposal mentioned earlier is based on this realization. Additionally, with the concentration of combat and combat support units to oppose the enemy breakthrough, an artillery battalion will routinely be able to fire in support of a large number of maneuver units. If a division *is* massed around a very narrow sector (perhaps 2 to 4 kilometers), as is likely in opposing a normal Soviet breakthrough attempt, every division artillery battalion might well be able to support every maneuver battalion opposing the main attack. In this situation, artillery fires should be under centralized control to provide support where it is most critical. With such control and the excellent artillery weapons available in our divisions, we could rapidly mass the fires of the entire division artillery to support each maneuver battalion in the breakthrough sector. We should not fritter away this massive capability by decentralizing control of it. Our new, active defensive tactics, which call for fighting hard in the covering force area and a rapid transition to fighting in a terrifically tight mass in the main battle area, make it almost imperative to retain divisional FA battalions in general support.

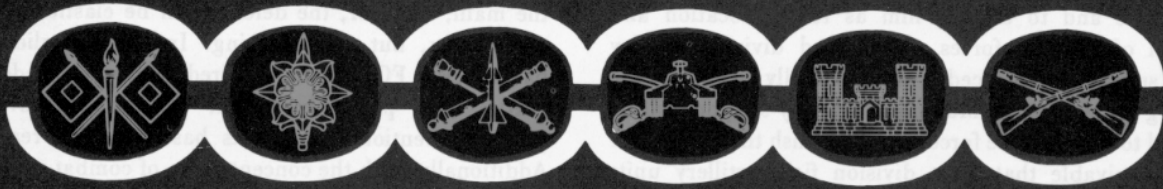
In summary, there are four reasons why division artillery units should be employed in a modified general support mission in the defensive situation we face in Europe:

- It allows a systems approach to land warfare.
- It enhances the security of FA battalions.
- It would allow us to oppose Soviet mass with mass.
- It is more consistent with the active defense recently adopted by the US Army.

Adopting a modified GS mission would provide us significant advantages and would, in fact, be more consistent with our long-standing principle of maximum feasible centralized control. Let us not force, on our defense, a doctrine which is superb for offense. Moreover, let us not make any secular doctrine so sacred that we are unwilling to expose it to scrutiny and constructive discussion. Until the divisions in Europe get significantly more field artillery, a general support mission is the best solution to the defensive firepower problem. ☒

MAJ William R. Calhoun Jr. is assigned to Headquarters and Headquarters Battery, 3d Armored Division Artillery, Germany.

with our comrades in arms



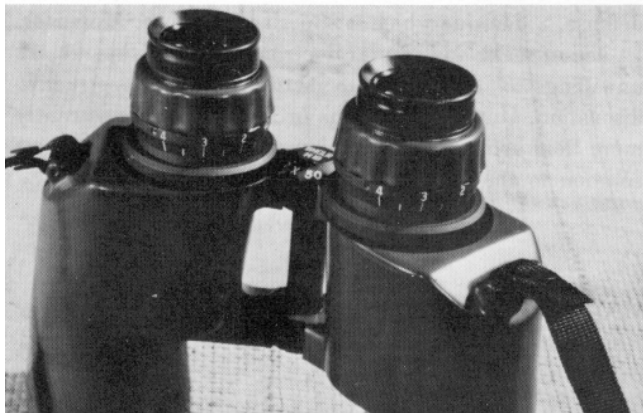
Army buys new binoculars

The first major change in military field issue binoculars since World War II has been made with the Army's acceptance of the M19 7×50 binocular. Manufactured by the optical division of Bell & Howell, the M19 is a lightweight, compact, general field observation instrument with a graduated angular mil scale reticle in the left ocular for use in range estimation.

Additional features of the new binoculars are modular construction and interchangeable eyepieces to facilitate easy field replacement in the event of damage to any component. The vinyl coated aluminum M19 measures 6 by 7 1/2 by 2 1/2 inches and weighs 34 ounces and has a 15-ounce case. It will withstand operating temperatures of -40° to + 51° C, 95 percent humidity, and a shock of 75Gs.

Production of the M19 started in July and is scheduled to reach an output of 1,600 per month by December. The Army is expected to purchase 35,800 M19s at \$205 each. A one-for-one replacement of current binoculars that cannot be repaired is planned rather than a mass issue of the M19.

M19 7×50 Binocular



Infantry Fighting Vehicle

One package planned for infantry fighting vehicle

Only one version of the mechanized infantry combat vehicle (MICV) is now planned by the Army instead of several separate versions previously under consideration.

The original plans called for an infantry version mounting a 25-mm cannon in a one-man turret and a follow-on scout version mounting the cannon plus the TOW antitank missile system in a two-man turret.

An accelerated program is now in motion to produce a single, high-performance combat vehicle to meet both requirements. This common vehicle will have a two-man turret equipped with a fully stabilized, dual-fed, 25-mm automatic cannon as the primary weapon. Secondary armament will consist of a Belgian, 7.62-mm MAG 58 coaxial machinegun. The only difference between infantry and cavalry versions of the vehicle will be in troop compartments.

The vehicle will weigh 47,000 pounds and, when used as an infantry fighting vehicle, will carry a nine-man squad

and mount six modified M16s in ballistically protected firing ports, thus permitting the squad members to actively engage the enemy on the move under armor protection.

The cavalry version will carry five men, but more TOW missiles as well as scout equipment and will not be equipped with firing port weapons.

It should have a top speed of 44 mph, a cross-country speed of 20 mph, and a water speed of 5 mph. Armor protection has been greatly improved over existing carriers by the use of space laminate armor on the sides and rear of the vehicle. Its mobility and 300-mile range will allow it to accompany the XM1 tank into battle.

Also changed are the vehicle's previous names (MICV, TBAT II, and MICV Scout). It will now be known as the Infantry Fighting Vehicle (IFV) or Cavalry Fighting Vehicle (CFV). User testing of the infantry fighting vehicle is scheduled for March 1979 with first production deliveries expected two years later.

Army takes single manager role

The Army will become the single manager for conventional ammunition in the continental United States on 1 October. At that time the Army will assume management of naval ammunition depots at Hawthorne, NV, and McAlester, OK, and establish a single manager activity at the Naval Weapons Support Center, Crane, IN.

The single manager mission as defined in DOD Directive 5160.65 is to eliminate overlap and duplication in procuring and producing assigned ammunition items accepted by the services. The mission has been assigned to the Army Armament Materiel Readiness Command, Rock Island, IL.

As single manager, the Army will serve as wholesale manager for inventory, maintenance, renovation, demilitarization, and disposal of assigned ammunition items.

9th Infantry Division hosts Soviet bloc officers

Military attaches from Russia, Hungary, Romania, Bulgaria, and Czechoslovakia were official guests of the 9th Infantry Division for two days in a recent DA-sponsored visit aimed at "improving and establishing lines of communication between our military and theirs."



Warsaw Pact military attaches who visited Fort Lewis are briefed on the combat arms training operation they are about to see. From left: COL Nicolae E. Calin, Rumania; COL Nikola I. Krivlev, Bulgaria; COL Laszlo Laczhazi, Hungary; COL Bohumil Vacha, Czechoslovakia; LTG Georgiy A. Michaylov, USSR; and BG Howard F. Stone, assistant 9th Division commander. CPT John Jaccard, Company A, 2-60th Infantry, gave the briefing. (Photo by SSG James Arwine.)

During their visit, the Warsaw Pact military attaches observed reconnaissance commando (RECONDO) training, a ranger parachute drop, a hand-to-hand combat demonstration, and several artillery missions including a "hip-shoot" and an improved conventional munitions (ICM) demonstration. An ICM round releases a multitude of small bombs that explode about four feet off the ground and are particularly effective against troops.

After the artillery demonstrations, the attaches watched infantry fire and movement maneuvers and were taken aboard Cobra gunships for a 20-minute ride termed "unforgettable" by the visitors. On the second day, a combined arms exercise with armor and APCs was observed followed by helicopter assaults and helicopter rappelling while artillery simulators and smoke supplied battlefield effects. This exercise concluded with troops of the 1st Brigade running through the smoke wearing gas masks. Displays of physical stamina including pit wrestling, the finish of the Division five-mile Fit to Fight Run, and a pushball game preceded lunch and a serenade by the division band for the visitors.

The afternoon was spent on the Fort Lewis range where the Communist officers observed tank and APC maneuvers followed by a demonstration of the division's antiarmor capability with the Dragon, TOW, and LAW and recoilless rifle fire.

That evening the Soviet attache visited with Div Arty at a formal ball while his comrades dined with a number of division officers and their families.

The attaches expressed strong admiration for the 9th Division through LTG G. A. Michaylov, the Soviet attache, who said, "Your physical fitness, your enthusiasm, and your military skills are simply superb. We are proud to have visited with you."

With Our Comrades In Arms

Lightweight mortar set for field

Pending Department of the Army approval, the new XM224 60-mm lightweight company mortar system (LWCMS) should be fielded in 1979 to replace the 81-mm M29A1 mortar now in use at company level in airborne, airmobile, ranger, and light infantry units.

The LWCMS weighs about 45 pounds, a savings of 49 pounds from the current 81-mm mortar, and projectile weight has been reduced to 3.75 pounds. The system is easily transported in two one-man loads, or by one man for short distances. It has an effective range of 3,500 meters and can be fired from the baseplate or from a handheld mode.

High explosive ammunition for the mortar includes an electronic multi-option fuze developed by the Harry Diamond Laboratories. The fuze is set by hand and no special tools are required. Selection of the fuzing action is reversible and has the following fuze function sequence:

- Delay (0.5 second after impact).
- Impact.
- Near surface burst (0 to 3 feet).
- Proximity (3 to 13 feet from surface).

Development of illumination and smoke cartridges and a training device has been recommended so the mortar may be fielded as a complete system.



XM 224, 60-mm Lightweight Company Mortar

Cobra TOWs join team

The AH-1Q Cobra TOW helicopter has made its appearance with the 3d Combat Aviation Battalion in Germany as part of the combined arms team of the 3d Infantry Division.

Equipped with the TOW missile, the Cobra is capable of destroying any armored vehicle in existence and can operate over terrain inaccessible to ground vehicles. In a recent training exercise, aviators flying Cobras used nap-of-the-earth techniques to attack "enemy" tanks from the rear.

Guided by OH-58 Scout helicopters, the Cobra TOW pilots receive information on targets at ranges up to 2,700 meters and fire their TOW missiles. Cobra TOW helicopters now coming off assembly lines are designated AH-1S but are similar in performance to the AH-1Q.

Locating system cancelled

The Field Artillery Acoustic Locating System (FAALS) (**FA Journal**, January-February 1977) advanced development program funds for Fiscal Year 78 have been deleted from the budget by congressional action. Consequently, the Army is terminating the FAALS program after two years of development. The program was based on research which was started in 1968 by the Applied Physics Laboratory, Johns Hopkins University. The prime contractor was Honeywell, Inc.

New attack helicopter delivered

The Army has accepted the initial production model of its most modern antiarmor helicopter, the AH-1S Cobra. The aircraft, built by Bell Helicopter Textron, is the first of 148 presently on order. The Army plans a total purchase of 305 new Cobras.

The AH-1S is very different from the Cobra used by the Army in Vietnam. Improvements in the aircraft include arming it with the TOW missile system, an improved engine and power train, a flat canopy, and an improved cockpit.

Next year a new gun and turret will be added. A new fire control system is two years away.

COLONIAL CANNON

SOUTH CAROLINA ARTILLERY

1670-1813

by Fitzhugh McMaster

Artillery played an important part in the history of many of the original colonies of North America.

In 1664, the King of England provided the Proprietors of the prospective colony of South Carolina with six sakers and six minions. Two of the minions were mounted on field carriages, and the other 10 cannon were mounted on the fortification carriages, each with four small wheels or trucks. These were all lost when the ship transporting them was wrecked in 1665, but the inclusion of field carriages indicates possible consideration of mobility and field service.

In 1670, approximately 140 Englishmen established the colony of South Carolina on the west bank of the Ashley River and rapidly fortified a nine-acre triangular area with earthworks and palisades. Four demi-culverins and eight sakers were promptly set up to cover both the river and its landward sides. The site was in territory claimed by Spain, and the nearest colony of any strength was an English colony at St. Augustine. The area was also populated by Indians whose intentions were suspect.



In August 1670, just four months after the initial landing, a Spanish amphibious expedition from St. Augustine arrived to stamp out the new colony. Apparently impressed by the defenses and the militant attitude of the English, the Spaniards remained on their ships outside the bar until driven off by a hurricane. Their Indian allies departed shortly thereafter when the iron cannon in the fortification was "scaled" (fired with reduced powder charges to blow the rust out of the barrels).

Late in 1679 the Proprietors ordered that the location of Charleston be changed to the peninsula between the Ashley and Cooper Rivers as a more defensible site. Most of the ordnance was remounted in the new site in 1680, with additional cannon mounted as they were received from England. By about 1704, Charleston was a fully walled city with the river side protected by a 20-foot brick curtain wall and the three landward sides defended by a 13-foot wide, seven-foot deep moat with a 10-foot high earth wall on its inner side. A bastion at each of the four corners of the city wall with redans in between allowed firing. On the side opposite the river, a ravelin with its own outer moat protected the two draw bridges which had to be crossed to enter or leave the city. About 80 cannon ranging from 24 pounders down through 4 pounders were then mounted in the defenses of the city proper. Historical records mention various individuals as "Gunner" or "Captain of the Battery," etc., with the responsibility of keeping the cannon and carriages in working order, but there is no mention of who actually manned the cannon or who received any training in loading and firing them. The Militia Acts up to 1747 mention only infantry training. Apparently the two militia companies in Charleston, with the help of additional militia brought in from the country, were expected to man the cannon in time of "alarm."

Uniform illustrations are by Darby Erd, Institute of Archeology and Anthropology, University of South Carolina. Weapon illustrations are from book Round Shot and Rammers Copyright 1969 by Harold L. Peterson, reprinted with permission of Stackpole Books.

Glossary

(*Wilhelm's Military Dictionary and Gazetteer, 1881*)

artificer—one who makes fireworks or works in the artillery laboratory and prepares the shells, fuzes, grenades, etc.

bastion—projection in a fortified wall.

cartouche—a roll or case of paper holding a charge of powder for a firearm.

coatee—a close-fitting coat with short flaps.

cockade—a rosette or similar ornament worn as a hat badge.

coehorn (cohorn)—a small mortar.

demi-culverin—4-1/2-inch cannon firing nine-pound shot.

fusil—a light musket.

mattross (pl. *mattresses*) (French)—a gunner or gunner's mate.

minion—3-inch cannon firing a four-pound shot.

palisade—strong, sharpened paling (stakes), 9 to 10 feet in length and 6 to 8 inches in diameter, set 2 to 3 feet in the soil.

patero—a short piece of small caliber, breech-loading chambered ordnance.

ravelin—fortification work constructed beyond the main ditch or moat.

redan—the simplest work in field fortification, consisting of two parapets with faces joining to form a salient angle toward the enemy.

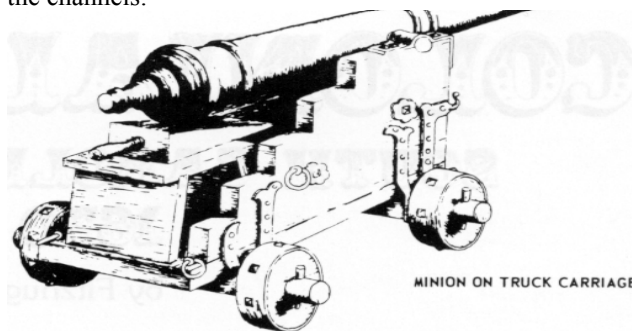
saker—3.5-inch muzzle-loading cannon firing a five-pound shot.

In 1706, a combined French and Spanish force attacked the colony. Three separate landings on the islands were bloodily repulsed by the militia. The enemy fleet fled when seven small trading vessels, reinforced with militia, sailed to attack them. Once again, the fortifications and the cannon mounted in them served their purpose in preventing an assault on the city — without firing a shot!

Two years later, construction was started on Fort Johnson on James Island, near the entrance to the harbor. Fort Johnson was a stone fort with 30 cannon and a permanent garrison of two officers and 12 men, to be reinforced by the James Island militia company in time of emergency. However, this militia company, like those in Charleston, was infantry and not required by the militia laws to receive artillery training until 1747 when a new law required the Charleston and James Island militia to drill two times a year at the great "gunns." Another fortification, Broughton's Battery, was built south of the walls of Charleston at the tip of the peninsula where the two rivers joined, adding another 40 cannon to the defenses.

By 1718, after the Yamassee War, when risk of Indian attack on the city had ended, the walls on the landward sides were demolished and used to fill the moat to permit expansion of the city. The fortifications on the river side were still considered essential and, after the surrender of Charleston in 1780, 311 cannon were listed as captured ordnance and 80 to 90 additional cannon were listed for

Fort Moultrie and other non-city defenses of the harbor. Some of the cannon listed for Charleston had been removed from ships before the ships were scuttled to block the channels.



In 1721, an Independent Company from England was stationed in a newly built South Carolina fort on the Altamaha River (now part of Georgia). These troops were British regulars and nominally infantry, but were organized for garrison duty on a non-regimented basis (to save having to pay any field officers). As garrison troops, they were theoretically artillerymen to a limited degree. Accompanying them were 12 patereros and 20 coehorns. Patereros were small caliber, breech-loading, rapid-fire cannon which could fire either scatter shot or a single solid shot and could be fitted with a swivel for mounting in a fort, or they could be mounted on a two-wheel carriage for field use. Coehorns were small mortars designed for lobbing grenades, but those in South Carolina were modified to fire scatter shot or solid shot horizontally at very short range. Coehorns were used in the frontier forts or were mounted on field carriages for use by troops on expeditions into Indian country.

In 1753, troops from the three Independent Companies then stationed in South Carolina built Fort Prince George about 250 miles from Charleston. It was a square fort with four bastions, approximately 200 feet from the corner of one bastion to another, surrounded by a dry moat. The earthwork walls were surmounted by a palisade of sharp-pointed wooden posts. In 1756, a swivel gun was mounted in each bastion.

In 1756-1757, an Independent Company assisted by two provincial companies built Fort Loudoun, a fort enclosing three acres near the site of present-day Knoxville, TN, in the Allegheny Mountains. The narrow, precipitous paths limited transportation of supplies and equipment to pack horses. Fort Loudoun was diamond-shaped with palisades and a moat thickly planted with honey locust, noted for its two-inch long thorns (a primitive but effective "barbed wire," particularly where naked Indians were concerned). Two of the four bastions commanded the Little Tennessee River, with the remainder of the fort extending down the landward side of the slope into the valley. Sixteen swivel guns, weighing approximately 300 pounds each, and two coehorns were provided for this fort. The heavier weapons posed a transportation problem as the muzzles bobbed up and down on the crude pack saddles, bruising the pack

horses or jolting them off their feet on the steepest parts of the path. A civilian trader and packhorse man solved the problem by bringing up the 12 heavy guns with the trunnions secured to the pack saddles in line with the horses backbone. At the fort, the 12 heavy swivel guns were converted to carriage guns by the garrison blacksmith and carpenters. During the Cherokee War, Fort Loudoun's garrison was forced to surrender due to starvation because of the fort's isolated location, but the artillery prevented attempts to take the fort by assault.

Late in 1756, a group of about 60 well-to-do gentlemen in Charleston, with the approval of the Royal Governor and the Commons House, organized themselves into a uniformed volunteer company which was to be trained primarily in the use of artillery, both garrison and field. Each officer and private was to provide his own arms, accoutrements, and uniform, all of which had to meet the prescribed specifications and be approved personally by the captain. An act was passed in 1760 legalizing the earlier informal establishment of the company and spelled out the organization in detail: a captain, a captain-lieutenant, a first and a second lieutenant, three lieutenant fireworkers (ordnance technicians), four sergeants, and not more than 100 privates (to be classed as bombardiers, gunners, and matrosses).

Uniforms

The original uniform was described as a blue broadcloth coat (slightly shorter than the regimental coat of the time), lapelled, lined, and cuffed with crimson cloth; yellow gilt buttons; crimson waistcoat; blue breeches; white stockings; and a gold-laced (edged) cocked hat. The officer's uniform had crimson velvet lapels and cuffs but otherwise was the same quality as the enlisted man's (some of whom were wealthier than the officers). A waist and shoulder belt of tanned leather, a black leather-covered cartouche box holding up to 24 paper cartridges, a firelock, and a bayonet were the equipment of the soldier. The officer was armed with a fusil and bayonet, a cartouche

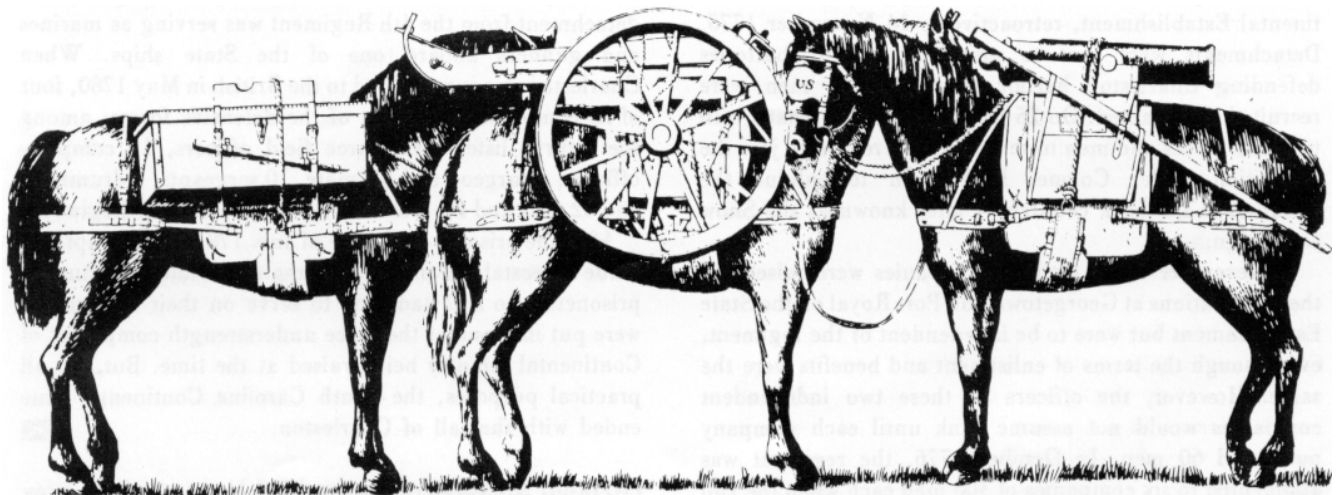
box, and a sword. The company was required to drill with both cannon and muskets at least eight times and not more than 12 times a year, in contrast with the other militia companies which mustered only six times a year. However, the Artillery Company paraded and fired salutes at ceremonial occasions, such as the King's Birthday or the arrival of dignitaries.

On the King's Birthday in 1768, the Charleston Artillery Company appeared in a "new and very genteel uniform" similar to that of the Royal Artillery. White waistcoats and breeches now replaced the former crimson and blue ones, but the blue coats with crimson facings, gilt buttons, and gold laced hats were retained. Officer's rank was now indicated by a gold aiguillette on the right shoulder in lieu of the velvet lapels and cuffs formerly worn. Apparently the old broadcloth waistcoats and breeches were retained for wear during cold weather. The Commons House that same year authorized the payment of 700 pounds to the captain of the company as reimbursement for the purchase of two brass 3-pound field pieces.

In 1778, the Charleston Artillery Company was augmented to a battalion of three companies. These men manned the batteries during the attacks on Charleston in 1779 and 1780, and a detachment of 80 officers and men took a prominent part in the battle of Beaufort in 1779. Among the American troops surrendered at the fall of Charleston were 12 officers, 10 sergeants, and 146 rank and file of the Charleston Artillery Battalion.

After the general exchange of prisoners in July 1781, the British still held Charleston. All of the Charleston militia, including the artillery, were assigned to General Marion's brigade and reported to him north of the Santee River.

The battalion was formally reconstituted in 1783 after the British evacuated Charleston. The battalion still maintained its status as a uniformed volunteer organization, and



MOUNTAIN HOWITZER, CARRIAGE AND AMMUNITION CHESTS PACKED ON THREE HORSES

the uniform was essentially as it had been except the overalls were replaced at first by breeches and then by trousers, either blue or white, depending on the season. About 1790 the "cape" was replaced by a small turnaround collar (still crimson).

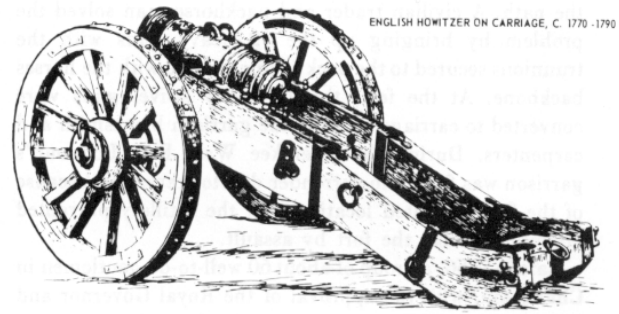
The Militia Act of 1797 established an artillery regiment in the Charleston (7th) Infantry Brigade consisting of two battalions with three companies each. The three companies of the Charleston Artillery Battalion became the First Battalion. The Second Battalion was composed of three volunteer artillery companies attached to three infantry regiments of the 7th Brigade.

Other units

Another volunteer company of artillery in Charleston during the Revolutionary War, identified as "Darrell's Company of Cannoniers," is referred to in some sources as a corps or a battalion. Joseph Darrell was a militia captain as early as 1776, but the date he raised his volunteer artillery is uncertain. It apparently served in the batteries of the fortifications of Charleston from about 1778 to the fall of Charleston in 1780. Another uniformed volunteer company in the Charleston Militia Regiment during the Revolutionary War was "Cannon's Volunteers." Despite the artillery sounding title, it was strictly infantry and named for its commanding officer, CPT Daniel Cannon.

The only regular regiment of artillery raised in South Carolina was the 4th South Carolina (Artillery) Regiment established 13 November 1775 by the Provincial Congress with an authorized complement of a lieutenant colonel-commandant, a major, three captains, three first and three second lieutenants, six lieutenants (fireworker), a paymaster, a quartermaster, an adjutant, a surgeon and his mate, a sergeant workman, 12 sergeants, 12 corporals, 30 gunners, an armourer and his assistant, three drums, three fifes, and 258 matrosses. It remained a State Regiment until 20 September 1776 when it was placed on the Continental Establishment, retroactive to 14 November 1775. Detachments were sent to man the various batteries defending Charleston harbor as rapidly as men were recruited and trained. On 25 November, a lieutenant with two field pieces and men to serve them were sent to join the expedition under Colonel Richardson to subdue the Loyalists in the back country — later known as the Snow Campaign.

In December 1775, artillery companies were raised for the fortifications at Georgetown and Port Royal on the State Establishment but were to be independent of the regiment, even though the terms of enlistment and benefits were the same. However, the officers of these two independent companies would not assume rank until each company numbered 60 men. In October 1776, the regiment was augmented to six companies of 100 men each when the two independent companies were added and the senior



lieutenant was promoted to captain to raise the additional company. The commanding officer of the newly raised 4th Regiment, COL Owen Roberts, had commanded the Charleston Artillery Company as a lieutenant and as a captain in 1760-1761. He commanded the artillery detachment in the Cherokee Expedition of 1761 and was captain of the Charleston Artillery from about 1768 to 1775 when he was commissioned major of the 1st South Carolina Regiment. Colonel Roberts was killed at the battle of Stone Ferry in June 1779.

The 4th Regiment furnished garrisons for many of the fortifications defending the three ports of the State and also provided detachments of field artillery for the southward expeditions of 1776, 1777, 1778, and 1779 into Georgia. Rather than using civilian drivers for the teams pulling the field pieces as was customary for this period, this regiment included driver matrosses in its ranks. During the attack of the British on the fort on Sullivan's Island (later named Fort Moultrie) on 28 June 1776, two officers and 24 men from the 4th Regiment were a vital part of the garrison's gunnery which so badly damaged the British ships that they had to break off the engagement. When the Continental frigate *Randolph* sailed from Charleston accompanied by four ships of the South Carolina Navy in early 1778, a detachment from the 4th Regiment was serving as marines and gunners aboard one of the State ships. When Charleston was surrendered to the British in May 1780, four of its companies were part of the defensive forces; among the returns listed were three field officers, 15 company officers, a surgeon and his mate, 10 sergeants, a drummer, and 62 rank and file from the 4th South Carolina Regiment.

After the prisoner exchange of July 1781, no attempt was made to reestablish the artillery regiment, and the returned prisoners who still had time to serve on their enlistments were put into one of the three understrength companies of Continental infantry being raised at the time. But, for all practical purposes, the South Carolina Continental Line ended with the fall of Charleston. ☒

Fitzhugh McMaster, a retired US Navy captain, now lives in Columbia, SC.



One-On-One With The Guard



by MAJ Roy E. Korkalo

Applied training technology in Active training support of Reserve Components

Some months ago, the 1st Battalion, 17th Field Artillery ("Professionals") were alerted to an upcoming mission of supporting the 3d Battalion, 115th Field Artillery ("Volunteers") of the Tennessee National Guard. Fresh from six months' temporary duty with "Increased Combat Capability Europe" in Germany, the 1-17th FA knew it would be a snap . . . just sign over the equipment to the "Volunteers" and advise. Right? . . . Wrong!

The chance of supporting the 3-115th FA was welcomed as a challenge by the 1-17th — a windfall training opportunity. Here was an open invitation to put the "One Army Concept" into practice, to provide the most innovative support package which could be devised, and to get the most out of the experience for their own upcoming unit training cycle.

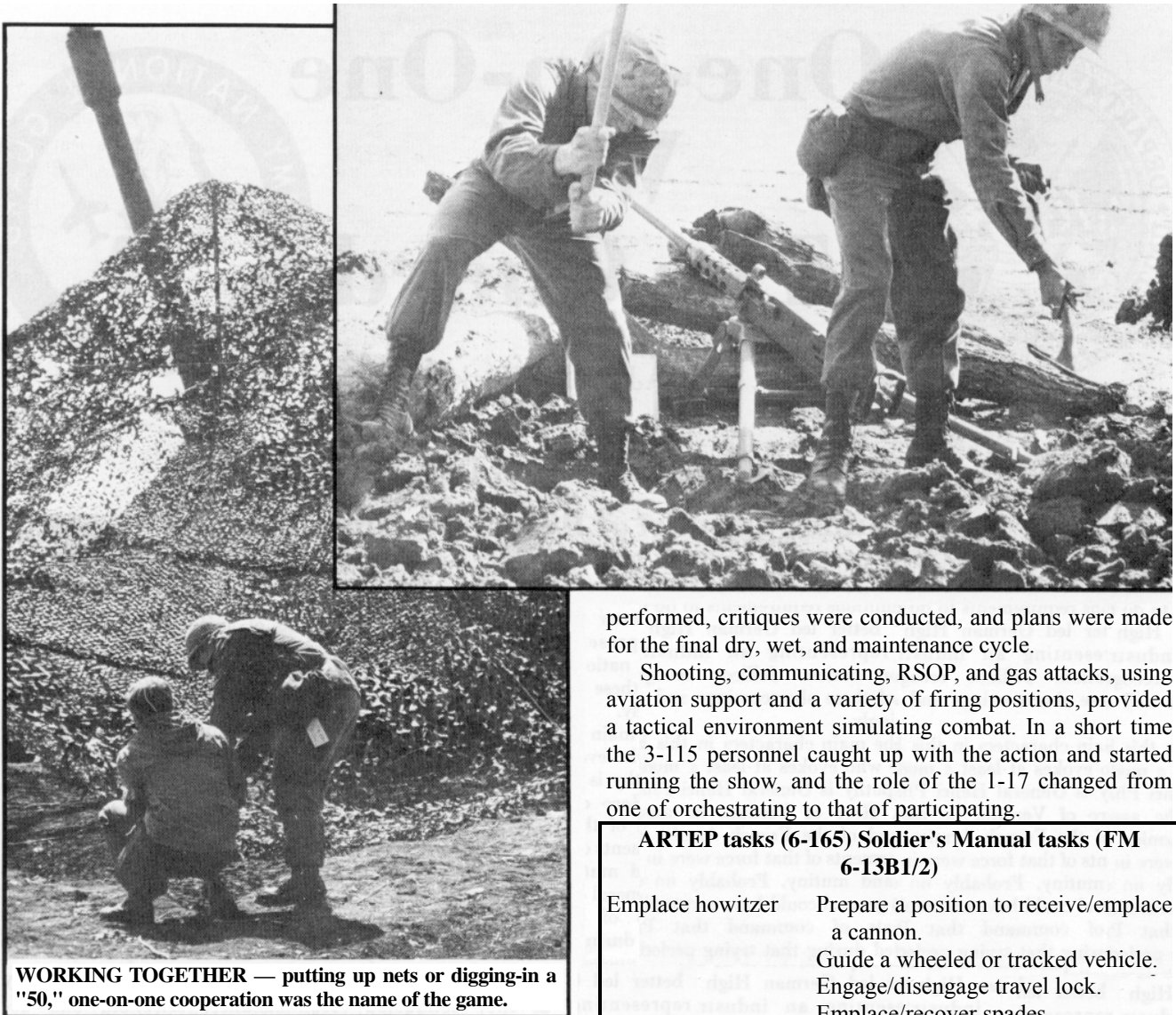
For two weeks both units combined to form one battalion, plus. The basic concept hinged on using the section chief as the trainer. The day after the 3-115 arrived, key personnel from both units met and combined the battalions into one. Some of the 3-115 sections were scheduled for Field Artillery School classes, leaving 13Bs, 63Cs, 94Bs, and ammunition personnel with the 1-17 for one-on-one training in basic skills. After a week of classes, the communication, survey, forward observer, Redeye, and fire direction personnel joined the combined unit. The basic concept was to create, at the section level, a unit composed of soldiers from both battalions with each contributing a section chief as the instructor.

After organization, no time was wasted. The first day, Signal Mountain felt the impact. The adrenaline level was high for many of the "Volunteers" since it was their first time to fire a howitzer. A good start, and the primary objective — to MOS qualify the 3-115 soldier — had begun.

The 1-17 training method of a "dry, wet, and maintenance battery" was used. Each day two firing batteries would be in the field. The dry battery would conduct MOS station training and perform tasks extracted from the Soldier's Manual FM 6-13B 1/2, while the wet battery fired selected missions from ARTEP 6-165. The third firing battery would be in garrison performing maintenance on all equipment, using the Soldier's Manual for a guide. Headquarters and service batteries were also actively involved in the training program, providing the needed support. Headquarters Battery ran a field mess and delivered hot meals to nearby firing points for the dry and wet batteries. They also established an "operations forward" that maintained communications with each battery as they conducted reconnaissance, selection, and occupation of positions (RSOP); day and night movements; and firing. Service Battery set up an ammunition supply point (ASP) for more than 1,000 rounds of ammunition. Additionally, maintenance personnel, including a track recovery vehicle, operated in the field. The exceptional maintenance that was provided enabled the battalion to maintain 18 operational M109A1s throughout most of the field training.

A typical cycle

Using standard RSOP techniques, the advance party of the dry battery departed downrange at the crack of dawn. As the main body arrived, a normal occupation was conducted, and then the battery set up and rotated personnel through six stations for the remainder of the day. At each of the stations, the gun chief trained his combined section in selected MOS tasks from the Soldier's Manual and FM 6-50. The section chiefs of both units maintained a "go/no



WORKING TOGETHER — putting up nets or digging-in a "50," one-on-one cooperation was the name of the game.

go" progress chart on each soldier. The Soldier's Manual tasks were appropriately aligned with ARTEP tasks to create a concrete foundation at the individual and section levels. Once the Soldier's Manual tasks were mastered, acquired skills were combined and resulted in successful performance of battery-level ARTEP tasks. Figure 1 shows how this alignment was accomplished for some tasks. This method can be easily expanded to encompass all ARTEP and Soldier's Manual tasks.

After supper, the battery displaced under the cover of darkness and occupied a night position. Night firing commenced with a high-burst registration followed by a fire-for-effect within transfer limits and a coordinated high explosive and illumination mission. The battery remained in the field overnight, and the following day it became the wet battery. At approximately 0630 hours, the battery displaced to a new firing position and fired selected missions from ARTEP 6-165 until mid-afternoon and then returned to garrison. The next day maintenance was

performed, critiques were conducted, and plans were made for the final dry, wet, and maintenance cycle.

Shooting, communicating, RSOP, and gas attacks, using aviation support and a variety of firing positions, provided a tactical environment simulating combat. In a short time the 3-115 personnel caught up with the action and started running the show, and the role of the 1-17 changed from one of orchestrating to that of participating.


ARTEP tasks (6-165) Soldier's Manual tasks (FM 6-13B1/2)

Emplace howitzer	Prepare a position to receive/emplace a cannon. Guide a wheeled or tracked vehicle. Engage/disengage travel lock. Emplace/recover spades. Establish and maintain communication with FDC.
Lay howitzer for direction	Lay cannon for initial direction of fire. Lay cannon for deflection.
Emplace collimator	Emplace/align/recover collimator.
Boresight the cannon	Boresight using DAP and test target.
Conduct indirect fire missions	Set/lay cannon for quadrant. Measure the quadrant. Load a prepared round for firing. Ram a projectile with power ramming. Fire the cannon. Place unfired powder increments in powder pit. Clear powder chamber after firing.

Figure 1. ARTEP/Soldier's Manual task alignment.

From the cannoneers, section chiefs, and battery commanders to the battalion commanders, the exchange of experience and one-on-one atmosphere proved to be a tremendous motivating factor.

The training results of the two-week period validated the success of this applied training technology approach. It proved that mastery of individual and section skills can be achieved within a short period using team and peer training methods. It proved that using the Soldier's Manual and ARTEP as baseline training documents yield a job-proficient soldier with little wasted effort, since only critical tasks are addressed. In the future, the MOS "Job

Books" could be used to reinforce the benefit of this type training by providing a usable evaluation instrument. Above all, this mission proved that Reserve Component support by Active units can have fun, provide a first class learning environment for both units, and make "one Army" — through one-on-one association — a reality. 

MAJ Roy E. Korkalo is S3 of the 1st Battalion, 17th Field Artillery.

1977 Readership Survey Results

We have received and analyzed most of the 1977 Readership Surveys and your assistance and comments are appreciated. The ideas submitted will help us improve the *Journal* in coming issues.

First some general statistics: Those returning questionnaires ranged from PFC to LTG; Active, Reserve, and retired; CONUS, Europe, Korea, and many other countries. We heard from most branches of the Army and all services. Sixty percent of the respondents were Active Army, 22 percent National Guard, and 12 percent Army Reserve. Seventy-two percent responding were officers and 23 percent enlisted (five percent in the lower four grades.)

Of those answering our questionnaire, 34 percent are in tube units and two percent are missileers. Seventy percent have college degrees or higher.

Copies of the *Journal* are retained as reference by 65 percent of you while 42 percent "spread the word" by passing copies around. (That's more than 100 percent because some readers circulate their copy before filing — there is a place in heaven reserved for those readers.) Eighty percent read more than half of each issue — 30 percent read it cover-to-cover. The most satisfying statistic is that 97 percent rate the *Journal* content as moderately or highly useful.

In comparing us to similar publications, 73 percent rated us "better than most" and 24 percent rated us equal.

Year after year you continue to rate "Right by Piece" as the most liked feature (76 percent favor it). Number two in popularity is "View From The Blockhouse" followed by "Incoming," "Forward Observations," "Redleg Newsletter," "Commanders Update," "Comrades in Arms," and "Redleg Review."

Ninety-seven percent of you believe the *Journal* is meeting its goal of being a forum for all field artillerymen. The final statistic we will throw at you is that 180 of you offered to write something for publication. Those so indicating who included a legible return address should have received a follow-up letter from us offering suggestions to aid your effort.

Now — what is wrong with the *Journal* or, better, what do you want? This is sometimes difficult to determine as we have a *varied readership* (paragraph 2) but a *limited target audience*. One of you would say "Cut out the history" and the next survey says "Need more history;" one says "Increase the humor" and another says "Stop the humor" and so it went. We hear you Reserve Components and Marines — we are actively soliciting material from and about you. We are the magazine of *fire support*, not just Active Army. You also want more on communications and we are working on that, too. You want controversy, more pages, more frequent publication, more for and by our enlisted personnel, and increased coverage of foreign materiel and doctrine. We will seek out such articles.

Every survey was read at least twice and the comments studied. Many of you received personal letters answering your questions or complaints. Rest assured that the time you spent completing the survey was well spent and appreciated. If your specific suggestion is not adopted, don't be discouraged — for each suggestion made there was an opposite opinion expressed and we weighed each for the most benefit to the most readers.

We thank you for your continuing support. Together we will keep improving your professional magazine.

The Journal Staff

P.S. Our sincere appreciation to CPT Ed Durham who assisted in analyzing the mountains of data you sent us.

Aids to training — the FA viewpoint

by LTC L. W. Butler

The Field Artillery must do a better job of training if we are to be successful in battle. Since the survival of our nation and our soldiers' lives depend on our readiness, great emphasis is being placed on developing training techniques and materials, usable in garrison and local training areas, that can help overcome the "hostile training environment."

The attainment of technical proficiency, speed, and accuracy of fires is a tradition with the Field Artillery. Recent developments have made this an increasingly difficult task. The *cost* of training has escalated to new highs — to complete an external ARTEP evaluation with an M109A1 battalion costs about \$33,000 for ammunition alone. Add to this the costs of fuel, repair parts, and some preparatory training, and the total cost could be as high as \$60,000.

Along with rising costs, training *resources* have also become increasingly scarce. Ammunition allocations are being further reduced, training areas are more difficult to obtain, and precious training time is dwindling. There is constant personnel turnover. Yet, in the face of all these constraints, the need for training to fight and win a battle on short notice is taking on increased importance. Training devices offer significant advantages in overcoming these constraints.

Devices and simulators have been a part of the Field Artillery's training effort for some time. Missile and rocket units have always been constrained by costs, allocations of live missiles/rockets for firing, availability of adequate live-fire training areas. Training on these systems is therefore heavily oriented to the use of devices and simulators — and it works. Technical skill training is possible without the requirement for elaborate facilities, and the risk of damage to high cost, critical components is eliminated. Training received via these devices is reinforced and evaluated in live-fire exercises, command post exercises, and field training exercises. The result is a realistic, carefully quantified training program that mixes simulation

and full-caliber training, increases individual and crew proficiency, and saves resources. The application of devices and simulators to cannon artillery training will follow this same philosophy.

Critical to the effective use of simulators and devices is the understanding that they *can provide effective training* for individual and crew proficiency without the customary heavy reliance on massive ammunition expenditures at major training areas. Even though simulation can never completely replace live-fire training, individual and crew proficiency can be increased while simultaneously saving resources.

Based on analysis of the various subsystems, those cannon unit training tasks that would benefit most from the use of simulators and devices are identified and developed in coordination with existing devices to insure complete coverage of the skills to be trained.

Analysis of current training methods and requirements is a continuing process designed to identify training deficiencies and training problems that can be offset by devices and simulators. As the needs are identified and justified, new devices or simulators are initiated.

As new materiel is developed, training devices to support the materiel acquisitions are identified, and device developments are initiated concurrently with the hardware development.

Before any device or simulator is considered for development, several questions must be affirmatively answered:

- Will it train?
- Is it cost-effective?
- Will it enhance part, or all, of the FA system?
- Is it suitable for field use?
- Can it be used for combined arms training?

Figure 1 shows the device/simulator initiatives that have been completed or are near completion. Each has shown a payoff in improved training effectiveness, reduced training

	FO	FDC	Firing Btry	Survey & Tgt Acq
M31 trainer	X	X	X	
AN/TPQ-36 and AN/TPQ-37 trainer				X
Low cost projectiles	X	X	X	X(-)*
Firing battery trainer			X	
Observed fire trainer	X			X
Direct fire trainer			X	
TACFIRE trainer		X		
105-mm ammo handler's round			X	
*Less sound ranging				

Figure 1.

costs, or both. Each has been designed with the needs of the field in mind. All but one, low cost projectiles, are usable in the garrison or local training area, are simple and effective devices, and offer the training manager a degree of flexibility not previously available.

It is recognized that training devices are not a panacea. However, they can provide significant increases in proficiency and do so within the garrison or local training area. Three of the devices in figure 1 offer firm examples of the benefits to be gained.

- **Artillery direct fire trainer (ADFT):** The direct fire trainer is a laser device that mounts on the howitzer tube. The gunner can practice the engagement of stationary or moving targets by tracking a target board that is mounted in a ¼-ton trailer. The device uses a one-tenth scale range, so training ranges of 40 to 160 meters correspond to battlefield ranges up to 1,600 meters. When the gunner "fires" the laser beam, a "hit" is readily apparent on the target. An evaluation of the training effectiveness of the device was conducted by the US Army Field Artillery Board.

Twelve "average" howitzer crews were trained prior to the effectiveness testing, six using the ADFT rather than standard training techniques. The two groups of six then competed in a "shoot-off" to measure the effectiveness of the training. The ADFT trained crews scored better at *all*

gun-target ranges with an overall "hit" rating of 62 percent to 48 percent for the crews trained in the standard way. Average engagement time for the ADFT trained crews was almost two seconds faster than for those trained with the standard training techniques.

- **Observed fire trainer (OFT):** The OFT is a device that displays artillery bursts on a panoramic terrain scene and allows training in the call for and adjustment of indirect fires. The device is usable in a unit classroom, and



An M31 trainer range with miniature men and one-tenth scale buildings and tanks.



initial unit issue will begin in late 1979 and ultimately will be issued to all field artillery units (Active and Reserve) having organic forward observers. A training effectiveness evaluation was completed on a similar device using students from seven Officer Basic Course classes. Data was collected on eight groups (712 students) with seven of the groups substituting the training device for portions of the live-fire training normally included in the course. The eighth group followed the normal course content. Six of the seven test groups performed *better* than the control group, and the other one performed as well as the control group.

• **M31 field artillery trainer:** The M31 has been in the hands of field artillerymen for some time. This 14.5-mm subcaliber device mounts inside the cannon tube and fires on a reduced scale range. While commanding the 4th Infantry Division Artillery, BG (then Colonel) Robert W. Sennewald assessed the value of the M31 as follows. "Our experience indicates that a unit gets as much effective basic artillery training in one day using the M31 as it gets in approximately three days of live-fire exercises. The trainer is particularly effective for cross-training and training of non-adjusting section crew members." He spoke further of a battalion expending 1,500 rounds of 14.5-mm ammunition in a three-day training period oriented on the ARTEP. The training resulted in a 50 percent reduction in mission times and was considered a primary factor in the unit's ability to achieve ARTEP standards. Without the M31, how could a battalion fire 1,500 rounds in three days of training?

Through proper use of training devices and simulators, the training manager can stress selected training tasks from

ARTEPs and Soldier's Manuals, evaluate proficiency, identify training deficiencies, and individualize training to accommodate learning abilities and concentrate on identified shortcomings. These capabilities often make the use of devices and simulators more valuable than actual equipment or live-fire exercises in the training program. For example, any number of realistic missions can be fired on the OFT to train observers in calls for fire, adjustment, communications, and map terrain association — all for the price of the time and electricity involved. Importantly, this training can happen in a dayroom. Put the FDC and guns into the "net," and the entire gunnery team is in action. Add to this a company team commander and his platoon leaders, letting maneuver drive the training, and the result is combined arms training. In general, the effective use of simulators and devices can assure that maximum benefit is gained from available live-fire exercises; the soldiers and units can be trained to near peak proficiency before the exercise begins.

There is no hard and fast rule for how much simulation is enough. The field artillery training manager must seek the balance between simulation, live-fire training, and other techniques that are best for his particular situation. Training devices and simulators, integrated with other training materials, can provide the unit training manager a means to attack the "hostile training environment." ✉

LTC L. W. Butler is Chief, Training Simulators Team, Directorate of Training Developments, USAFAS.

A Million-Dollar Song

It must have been somewhat of a surprise to LTC George H. Green, commanding the 3d Field Artillery, to receive in November of 1926 a radio message from the Chief of Field Artillery to:

"Advise by wire name of regimental march or song — Snow."

Nevertheless he promptly radioed back to Washington:

"Third Field Artillery does not have a regimental march or song — Green."

A few days later a letter from the Chief explained that the General Staff wished to honor and surprise the new Chief of Staff of the Army (MG C. P. Summerall) who had once

served in the 3d FA. General Snow then added a handwritten postscript:

"P.S. I am glad you have no regimental song — the fewer field artillery regiments that have individual songs the better; for we have in the "Caissons Go Rolling Along" the best song in the Army, applicable to the whole field artillery, sung the world over, the envy of the other arms, and I never want to see it displaced by a whole lot of mediocre or worse regimental tunes. The Commandant of the Infantry School once told me that a song like that would do more good to the Infantry than a million dollar appropriation for them" W.J.S. — 12/4/26.

General Snow was again ahead of his time. The Army did appropriate the Caisson Song to inspire the entire branch of service. The *Journal* appreciates the above contribution from MG (Ret) George Ruhlen. —Ed.



*The fourth Annual Forces Command/Training Command Conference (AFTCON) was held at Fort Sill recently. The subject of the conference was training, and, since Fort Sill is a leader in all phases of TRADOC training activities (as well as being a beautiful post), it was selected as the site for the conference. More than 90 General Officers, including the Chief of Staff, attended the day and a half session. Presentations covered all aspects of training and were presented Huntley-Brinkley style by representatives of TRADOC and FORSCOM. The points made were of interest to everyone involved with training and are summarized for **Journal** readers.*

Collective training was the first item on the agenda after opening remarks by General Depuy (see July-August *Journal* for some of General Depuy's remarks). The podium was shared by two tankers — Major General McEnery, Commandant of the USA Armor School and Major General Patton, Commander of the 2d Armored Division.

The ARTEP was categorized as establishing unit training objectives, providing a guide to training and evaluation of units, evaluating training effectiveness, and assessing training needs. Though the ARTEP concept is proving to be invaluable to the 2d Armored, the point was made that current and future revisions of ARTEPs will:

- Provide for combined arms training and evaluation.
- Integrate the philosophy of TC 21-5-7.
- Contain "modules" for command/staff groups.
- Include ammunition guidelines.
- Emphasize night operations, electronic warfare, and NBC techniques.
- Integrate engagement simulation.
- Provide three levels of training instead of two.
- Improve feedback techniques.
- Emphasize internal evaluation.

General Patton told the conferees that his division was so enthusiastic about the ARTEP concept that they implemented the program on receipt of draft publications — and that enthusiasm has not waned. He fully supports the diagnostic nature of the system. Emphasis has been placed at the "sub-unit" level, where the armor battle will likely be fought one-on-one. The 2d Armored does not award satisfactory or unsatisfactory ratings. The division has some unique twists such as using the III Corps opposing force (OPFOR) company located at Hood. A division ARTEP headquarters has been established and manages the program, sending Division tactical operations center and brigade staff skeletons to the field to control maneuver. All evaluators attend a course before going out to rate the units. Among the evaluators are Reserve Component personnel from the 75th Maneuver Area Command. All units receive a critique attended by the Division Commander.

REALTRAIN (realistic training) and MILES (multiple integrated laser simulation system) are used extensively to add realism and interest to the evaluation program. REALTRAIN provides near real time weapons effects, simulates combat casualties, penalizes improper small-unit moves, and emphasizes the use of cover and concealment. REALTRAIN instills a sense of competition and adds a significant degree of realism that more than offsets the monetary cost. MILES provides an eye-safe laser engagement system which eliminates subjective evaluations of casualties.

The second presentation was co-produced by Major General Menetrey, Deputy Commander of the Combined Arms Training Developments Activity and Major General Benedict, Commander of the 1st Infantry Division. Their discussion dealt with training "battle captains" and their staffs. Training of units has always been fairly easy and effective in comparison with the training of commanders

and staff officers which often required extensive use of troops in the field, high costs and set-piece scenarios. There were no specific training objectives, innovation was impossible, real time play was seldom attainable, and casualties and logistical play were unsatisfactory.

To rectify these problems, two ARTEPs were specifically created to train the battle captains and their staffs. ARTEP 100-1 for brigades is to be printed in late 1977 and ARTEP 100-2 for division commanders and staffs will be out in February or March 1978. To augment these ARTEPs, there have been a series of war games devised for use in units of various sizes, and they are exportable — meaning Reserve units will have ready access to them.

War games	Available	Applicability
Dunn-Kempf.....	FY 77	Emphasizes maneuver and fire support on a terrain board.
Longthrust.....	FY 78	Battalion level coordination of combined arms operations.
Pegasus.....	FY 77	Battalion and brigade staffs for control of combined arms operations.
First Battle.....	FY 77	Division staff control of combined arms operations.
CAMMs	FY 78	Free-play CPX adaptable to armored cavalry regiments, brigades, and battalions.

The next presentation, by Major General Latham, Commandant of the Infantry School, and Brigadier General (P) Rosenblum, Commander of the 24th Infantry Division, covered such subjects as Soldier's Manuals (SMs), skill qualification tests (SQTs), self-paced instruction, one-station unit training (OSUT); and NCO and officer training. The first point discussed was the "division of labor" between the TRADOC and major Army commands — who teaches what to whom and where. The new series of Commander's Manuals address this subject and spell out for each MOS which skills will be taught by institutions and which will fall to the unit. Recently, the training load on the unit has significantly increased as efforts have been made to have soldiers spend less time in schools and more time in the unit. A great assist to the unit in its training responsibilities is the Soldier's Manual which tells each soldier exactly what he needs to know to do his job. This direct relationship between individual proficiency and unit performance ties the foundations of training to ARTEP success. This individual proficiency is necessary to successful collective training, but does not guarantee it.

Associated with individual training is the concept of self-paced instruction (see *FA Journal*, July-August 1977). The most effective way for a soldier to learn a skill is for the soldier to have a tutor/model who can provide feedback, evaluate performance, and give encouragement. At present, more than 50 courses within TRADOC use this concept, and the 24th Division's NCO reclassification program for

MOS 11B is totally self-paced.

One-station unit training which replaces combined basic and advanced enlisted training is being phased in throughout the Army. General Rosenblum had high praise for the artillery and engineer soldiers who had received OSUT.

Officer training time within TRADOC has been shortened and made more specialized. This specialization means that no longer will all officers in the basic or advanced courses receive the same training. All will get a certain amount of instruction appropriate to the stage of career development for the particular branch, but a sizeable portion of the resident training will be specifically oriented to the student's next assignment — Lance, M109, towed 105-mm, etc. Units may then avail themselves of additional training such as jumpmaster, Ranger, or locally conducted war games and seminars.

The NCO Education System (NCOES) was created as an adjunct to the Enlisted Personnel Management System to provide timely training for the professional development of NCOs. The 24th Division sends *good* soldiers to the Primary NCO Course and Basic NCO Course and receives in return a *better* soldier and a trained leader. In addition to the formalized instruction, there are training extension courses (TEC), Expert Infantryman Badge qualifications, and the Army Correspondence Course Program (ACCP) to supplement NCOES.

The ACCP was one of the subjects addressed by Major General Forrest, Commander of the 4th Infantry Division (Mech), and Brigadier General Pearson, Commander of the USA Training Support Center. They discussed the TRADOC and FORSCOM aspects of training support which includes training devices and simulators, TEC, ACCP, and the entire Army training literature program. General Forrest is a very excited believer in the value of devices and simulators. He said that items such as the M31 artillery trainer, the inert Claymore, and the subcaliber LAW (light antitank weapon) make the modern training system possible. No longer are commanders hamstrung by dwindling live ammunition stocks. Now a tank crewman can engage literally hundreds of enemy tanks each year. In the first half of 1977, the demand for devices and simulators from Fort Carson and Reserve units supported by the 4th Infantry Division has doubled. TRADOC has developed a systems approach to insure that as new combat materiel is developed and procured, appropriate simulators or training devices are part of the item "package." All is not "roses" with these training aids, since funds for building/buying them are as constrained as for other items.

The entire ACCP has been consolidated at Brigadier General Pearson's headquarters. Prior to the consolidation, almost every post with specialized proponentry tried to manage its isolated group of courses. With 250,000 soldiers involved in the ACCP, centralization was mandatory. Enormous dollar savings have already been realized and


responsiveness has improved. Rather than a huge envelope of books, tests, and templates, the correspondence student now receives one volume with everything he or she needs to master the material. As courses are revised, the subject matter is being aligned with SMS/SQTs for composite MOS progression.

TEC learning centers are as popular at Fort Carson as hot dog stands. Units go so far as to set up tents in the field with learning centers and audio visual materials. There are 153 TEC viewers at Carson and more than 85 in the hands of supported Reserve units. The average unit TEC library contains 150 to 200 lessons. Army-wide there are approximately 3,000 TEC account holders and the number grows daily. There is a strong desire for TEC materials, and the challenge is not to allow the interest to lag through inability to feed the system. Lessons for combat support and combat service support subjects are reaching the field faster now that the combat skills are taken care of.

Finally, Major General Haldane, DCSOPS, FORSCOM, and Major General Gorman, DCST, TRADOC, presented data concerning the Army's plans for developing two national training centers — Fort Irwin, CA and Fort Drum, NY.

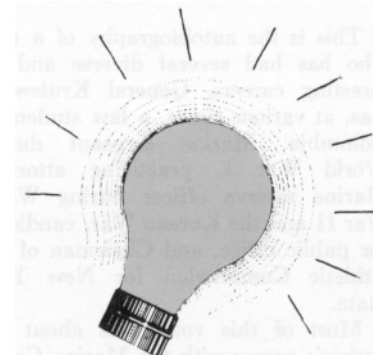
Acreage once adequate for a division is now marginally adequate for a brigade with the increase in weapons ranges

and changes in maneuver doctrine. Many posts are not large enough to permit electronic or chemical warfare training. Some post ranges will not accommodate airstrikes so essential to joint operations training. Finally, after several trips to the field, units have memorized the terrain, robbing exercises of that unknown essential to combat. To counter these problems, the Army wants to establish national training centers at the 642,000-acre Fort Irwin and the 107,000-acre Fort Drum. These two facilities, which are not currently fully used, would accommodate units up to brigade strength, would allow firing of all divisional weapons systems, and would provide both desert and cold-weather training areas in the contiguous United States. The plans call for prepositioning equipment belonging to Reserve Component units stationed in the immediate area of Irwin or Drum. Units using the centers would arrive, sign for the equipment, train, turn in the equipment, and return home. Studies are under way to determine the feasibility of permanent rotational training bases, and Fort Irwin has already had several battalions test the concept.

This summary has barely scratched the surface of the issues raised at AFTCON IV, but it has hopefully brought everyone up-to-date on current activities in the training environment and provided a quick look at the immediate future. —Editor. 



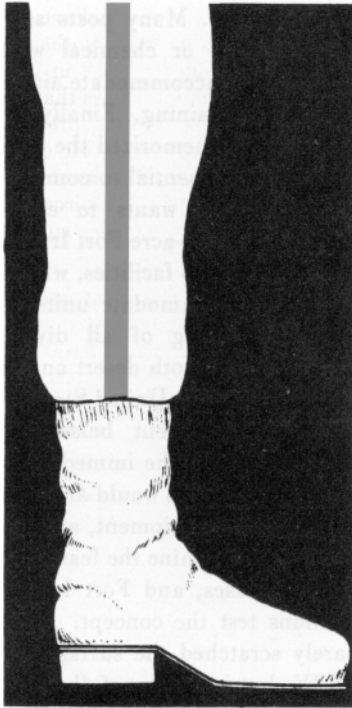
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Redleg Review

NOW THAT YOU MENTION IT, by Major General Melvin L. Krulewitch, Quadrangle/The New York Times Book Co., New York, 1973, 257 pages, \$6.95.

This is the autobiography of a man who has had several diverse and interesting careers. General Krulewitch was, at various times, a law student at Columbia, Marine sergeant during World War I, practicing attorney, Marine reserve officer during World War II and the Korean War, candidate for public office, and Chairman of the Athletic Commission for New York State.

Most of this volume is about the author's career with the Marine Corps. His anecdotes range from a young corporal on leave in France during WWI to a colonel organizing a provisional unit of rear area troops to relieve an infantry battalion at Iwo Jima.

The author points out that, over his vehement protests, approximately one-third of the original manuscript was deleted by the publisher. This is unfortunate, because the book's style becomes stilted and choppy in the chapters dealing with the author's career after WWII.

The author's description of Marine recruit training during World War I is most interesting. Nearly a full chapter is devoted to his training as a private during a hot summer at Parris Island, SC.

Now That You Mention It is not written for the professional soldier who wants to increase his knowledge of a military subject. Although the author participated in several hard-fought campaigns that are part of the Marine Corps heritage, he does not bore the reader with details of these campaigns. Instead, the author focuses on his particular battle experiences, giving brief descriptions of campaigns in which he served.

ILT Wayne J. Anderson is assigned to the 2d Battalion, 122d Field Artillery, ILARNG.

THE SWORDBEARERS, by Correlli Barnett, Indiana University Press, Bloomington/London, 1975 (1963), 413 pages, \$15.95 (cloth), \$4.95 (paperback).

By compiling mini-biographies of four leading military figures of the time, Correlli Barnett has given us a concise, readable and accurate history of the First World War. His ability to capture the details of significant events in the lives of his protagonists, without becoming enmeshed in minutia, makes this anything but a dull history book. The four commanders-in-chief the author selected for his leading characters exercised a profound effect on the course of history.

Colonel-General Helmuth von Moltke, executor of the Schlieffen Plan, commanded the largest army assembled to that time. Von Moltke, an officer of wide military experience and education with a degree of intellectualism rare in Prussian officers of that day, nonetheless failed to detect the flaws in the Schlieffen Plan. This lack of foresight or temerity doomed to failure a less than adequate plan.

When the awesome task of carrying out the wishes of the emotionally unstable

Kaiser fell on his shoulders, von Moltke, at 66, already suffered from heart trouble and shortness of breath. Thus, to a sick man, lacking the drive and determination of a Patton or a von Rundstedt, went the responsibility of defeating France and Russia.

General von Moltke's efforts, while not successful in defeating the two countries, did succeed, however, in leaving the Germans with a strong strategic advantage for the three years of trench warfare that followed.

To compensate for this strength, the Allies relied on the much heralded, but yet untried, British Grand Fleet commanded by Admiral Sir John R. Jellicoe, an able commander with a clear understanding of the situation. Like most of his contemporaries in the British Navy, he did not enjoy a reputation as a grand strategist. Neither had he any great amount of advanced staff training. During the preceding 50 years, English industrial and military society had been subordinated to the aristocracy. A first-rate military staff and a dynamic industrial complex were thus improbable, if not impossible.

The British Grand Fleet not only lacked well-trained officers, but also fell short of fulfilling many of the armament and munitions requirements to do battle with a better led German High Seas Fleet representing an industrially superior nation. Jellicoe recognized many of these shortcomings and acted accordingly.

Of the main characters in this book, the one who evokes at least a modicum of sympathy is General Henri Philippe Petain. Hero of Verdun, he assumed command of the French Armies when large segments of that force were in open revolt and mutiny. Probably no other French general could have accomplished the feats of command that Petain exhibited during that trying period. He not only quelled the disturbances, but also succeeded in restoring morale and esprit, rebuilding a fighting army.

After becoming commander-in-chief, Petain's greatest accomplishment was to hold the front without further losses to await the arrival of the Americans. His greatest failing, if one can call it that, appeared to be a lack of aggression.

To General Erich Ludendorff fell the unenviable duty of being in command of The German Army when it capitulated in November 1918. Fresh from success as Hindenburg's chief of staff on the eastern front, Ludendorff sought to defeat the Allies and hand the Kaiser an early victory. His aggressiveness eventually proved his undoing. A strong supporter of the Admiralty's unrestricted submarine warfare to reduce the pressures on the Fatherland, he formulated and attempted to carry out a series of offensive operations. His plans had major faults in design and required far greater military acumen than Ludendorff possessed. Indecision, impulsiveness, and a quick, and unreasonable temper are not traits that make great generals.

Throughout this book the author assesses the economic, political, social, and industrial imbalances which so greatly influenced the outcome of the war. He also gives us insights into the effects these elements had on the postwar years. It is particularly pleasurable to read a history book that doesn't give such detailed explanations of the causes and effects that one becomes bogged down in a plethora of words.

COL (Ret) Howard F. Brown resides in East Greenwich, RI.

HISTORY OF THE SECOND WORLD WAR, by B. H. Liddell Hart, G. P. Putnam's Sons, New York, 766 pages.

Because of its massive authenticity and unflinching conclusions, this book may be the most important work of military history to have emerged from World War II. It is a work that every student of military and world history, every serious reader, and everyone who was engaged in WWII *must read!* This magnificent work is based largely on Liddell Hart's personal collection of private documents and his constant study of the day-to-day events of WWII. The serious reader must be prepared to spend many long hours of reading, not compulsory, but by choice. After reading

the first page, the work is such that it cannot be put aside and forgotten; it must be read.

The book does not always make for comforting reading. Long-standing cherished illusions fade under fresh surveillance; reputations are reexamined; and startling new conclusions are reached based on previously unpublished "behind the scenes" notes and documents. Among the startling conclusions reached in this book are the following:

- The European war could have ended in September 1944, if General Eisenhower had not diverted gasoline from General Patton's Third Army to Field Marshal Montgomery's Army Group, thereby preventing Patton from plunging headlong into the very heartland of Germany.
- The Russians and the Germans discussed a negotiated peace in 1943.
- The massive Allied air bombings of German cities were ineffective and caused needless loss of lives.
- Evidence that this costly war was totally unnecessary and could have been prevented by a firm stand by Great Britain and France long before Hitler invaded Poland.
- The use of the atomic bomb against Japan was not really needed to bring about her surrender. With nine-tenths of her shipping sunk or disabled, her air and sea forces crippled, her industries wrecked, and her peoples' food supplies shrinking fast, her collapse was already certain.

Liddell Hart has written, without a doubt, the best book on World War II likely to be printed.

CW2 Bernard J. Lane is a radar technician with the 1st Battalion, 229th Field Artillery, Pennsylvania Army National Guard.

B-17 FORTRESS AT WAR by Roger A. Freeman, Charles Scribner's Sons, New York, 1977, 191 pages, \$10.95.

Any airplane that an aircrew flies successfully in combat automatically becomes the "finest airplane ever built." More than 10,000 B-17s were built and most of them saw combat; so the B-17 is undoubtedly the most praised and publicized aircraft in history.

At first glance, "B-17 Fortress at War" appears to be just another book romanticizing about the B-17 in WWII, but closer examination shows that this is not the case. The author presents a history of the aircraft itself. He explains design deficiencies, as well as strengths, and tells how and why the aircraft was modified to become the successful weapon it was.

A large portion of the text is devoted to first-person accounts by combat veterans who explain what it was like to fly missions in the B-17. These accounts, one for each crew position in the airplane, contribute greatly to the reader's understanding of the aircraft.

The book contains more than 250 photographs, many in color, showing aircraft modifications and scenes of combat. While the pictures are interesting, they tend to overwhelm the text. Readers who can get by the pictures will find "B-17 Fortress at War" to be an interesting and worthwhile addition to the many works about this famous aircraft.

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

A STUDY OF ORGANIZATIONAL LEADERSHIP, an anthology edited by the Office of Military Leadership, US Military Academy, Stackpole Books, Harrisburg, PA, 1976, 600 pages, \$8.95.

A thorough course in organizational leadership, this compendium of 49 short articles is used as a text for the study of leadership at the US Military Academy. The articles are authored by faculty members and other military officers, and several are reprints of outstanding contributions from other sources.

Some of the sub-groupings deal with the individual to be led, the leader, the group and the interaction and communication as they support or detract from the leadership process. The various concepts and theories of leadership are woven into a single, coherent unit. While the book is strongly oriented toward the military, the principles discussed are widely applicable to the civilian sector. The treatment of the various psychological components of leadership require a basic familiarity with terms relating to social psychology, sociology, and group behavior. —Ed.

