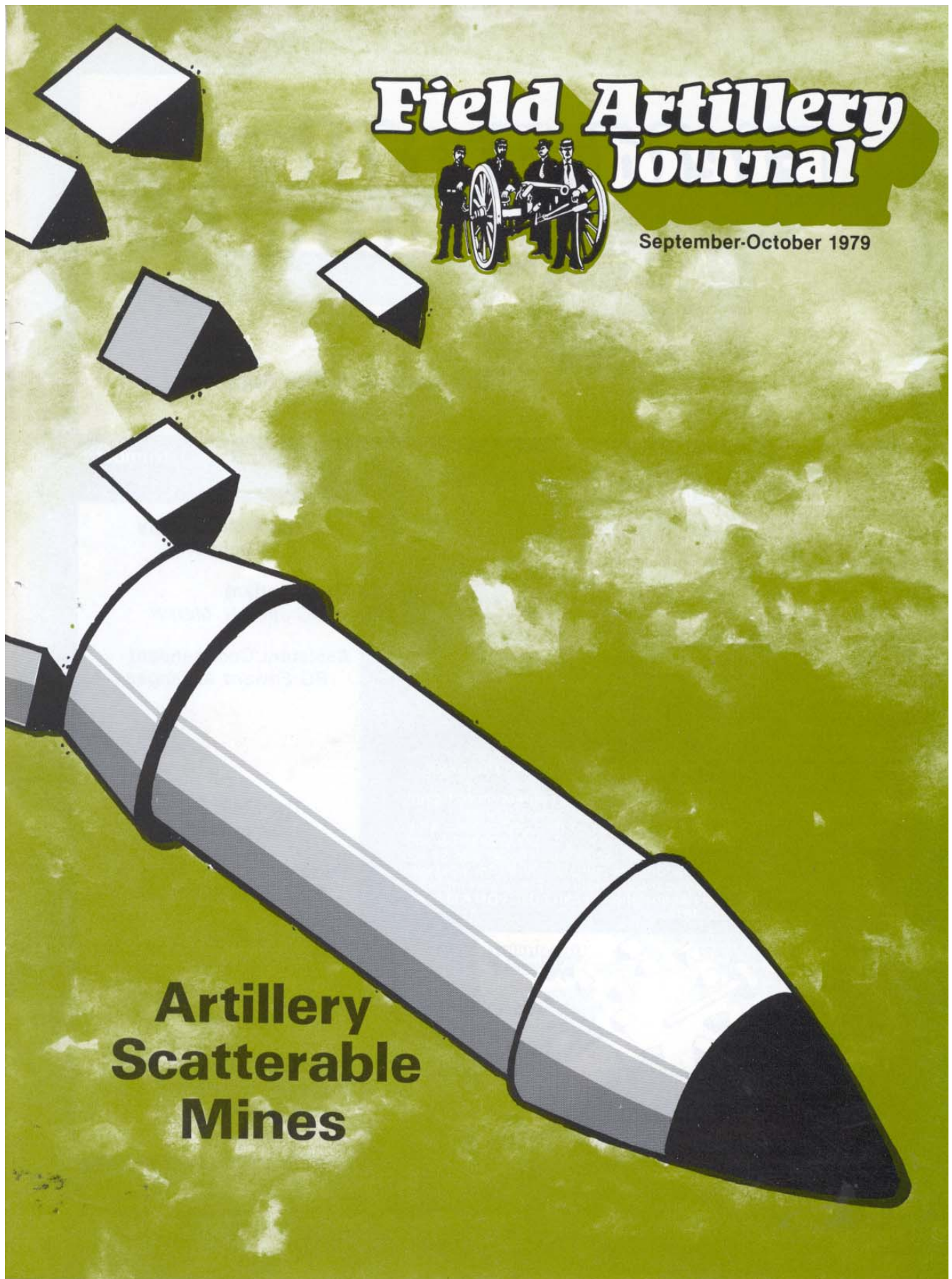


Field Artillery Journal

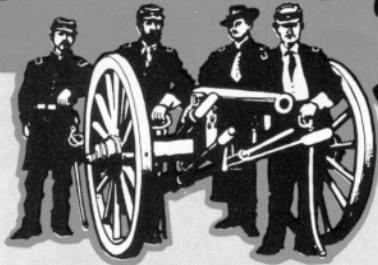


September-October 1979

**Artillery
Scatterable
Mines**



Field Artillery Journal



The Journal of Fire Support

Volume 47

September-October 1979

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."

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

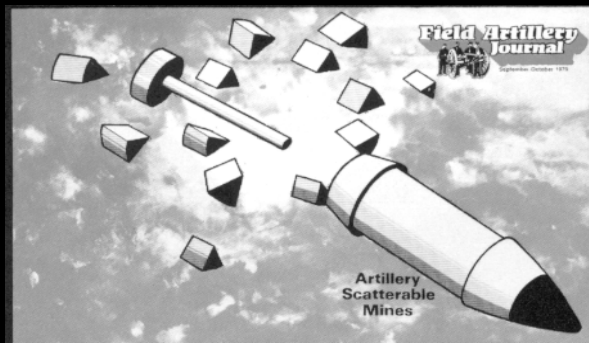
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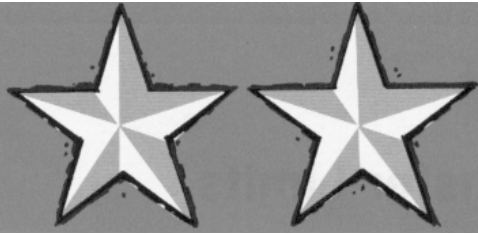
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On the Move...

In previous issues of the *Journal* I have discussed with you several actions in which Fort Sill is involved as part of the Division '86 effort. I would now like to comment on another equally important issue.

Last fall, at the direction of the United States Army Training and Doctrine Command (TRADOC) Commander, the Field Artillery School began a review of tactical nuclear considerations. Subsequently, the field and TRADOC identified four problem areas: lack of direction in TRADOC for developing nuclear concepts and doctrine; lack of a coherent concept for the employment of tactical nuclear weapons; a shortfall in conducting integrated nuclear/nonnuclear operations; and insufficient instruction on the employment of tac nuke weapons on the integrated battlefield.

The Action Plan for Integration of Tactical Nuclear Considerations into TRADOC, approved in April 1979, addresses these problem areas and lays out a three-year corrective program, involving four broad categories of effort: management, doctrinal development, material development, and resident/nonresident instruction. Here's how the plan attacks the problems we have identified.

Management

In the management category, we found that, although many people were working the nuclear problem, there was no focus for the overall effort. The Action Plan calls for new offices at both the Combined Arms Center at Fort Leavenworth and HQ TRADOC to provide direction as well as to integrate the efforts of all centers and schools. This ought to reestablish TRADOC as the user representative for nuclear matters. A General Officer Steering Committee which includes representatives from major commands and the DA staff assists these offices and provides the kind of overarching guidance we need.

Doctrine and material

In doctrine and material development we found a systemic problem: the Army lacks a basic concept for operations on an integrated nuclear/nonnuclear battlefield.



by MG Jack N. Merritt

Such a concept is essential as a basis for developing doctrine, tactics, techniques, and procedures for operating in this type environment. The concept has been developed and published as the US Army concept paper, entitled "Operational Concept for the Tactical Employment of Nuclear Weapons on the Integrated Nuclear/Nonnuclear Battlefield."

Its principal elements include:

- Battlefield interdiction (discussed in the May-June issue) is the preferred role for tactical use of nuclear weapons.
- Tactical employment of nuclear weapons provides an opportunity for initiating offensive operations.
- The planning, coordination, and employment of nuclear weapons must be integrated with nonnuclear force operations both in the offense and the defense.
- Integration will be achieved through the use of means common to both nonnuclear and nuclear operation for intelligence collection and fusion, target acquisition, command and control, communications, operation planning, and fire support.
- Dual-capable systems are essential for continuous target planning and attack.

The Action Plan tasks Division '86 study groups to develop supporting doctrine. As I discussed in the March-April 1979 *Journal*, Division '86 is a coordinated effort headed by the Combined Arms Center at Fort Leavenworth with broad participation from every school and Army agency that have any involvement in the functioning of a combat division. As specific tactics and techniques evolve from these study groups, they will be sent to the field as draft Training Circulars explaining "how-to" operate on an integrated battlefield. These draft TC's will be the medium to quickly percolate these tactics and techniques to the field until they can be incorporated into our how-to-fight manuals. The goal is for all publications—SQTs, ARTEPs, Commander's Manuals, Soldier's Manuals, and field manuals—to include the nuclear requirements for integrated battle. These tactics and techniques will permit review and modification, as required, of our developing organizations, and that should add greatly to efficient operation of our forces. These same Division '86 study groups will concurrently identify materiel deficiencies, the end result to be continuing user involvement in developing materiel for use on the integrated battlefield.


Toward this end, Fort Sill is currently participating in a study of how well candidate Division '86 organizations can operate on an integrated battlefield. This involves subjective nuclear strikes and examination of remaining

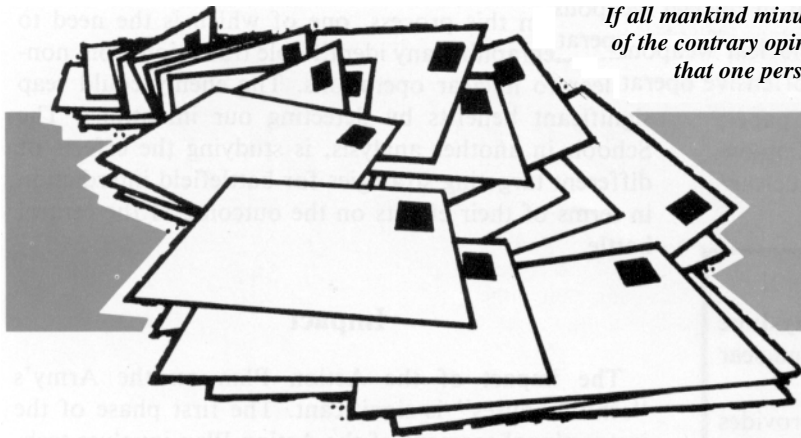
mission capability. We are gaining valuable insights from this process, one of which is the need to avoid telegraphing any identifiable transition from nonnuclear to nuclear operations. The enemy could reap significant benefits by detecting our intentions. The School, in another analysis, is studying the effects of different targeting strategies for battlefield interdiction in terms of their effects on the outcome of the central battle.

Impact

The impact of the Action Plan on the Army's "school-houses" is significant. The first phase of the instructional segment of the Action Plan involves technical instruction for which detailed procedures are available. At Fort Sill, this includes restarting instruction such as 8-inch Atomic Assembly Courses and reincorporating Nuclear Target Analysis (Prefix 5) into the core curriculum of the FA advanced course. Additionally, a Custodial Unit Course is being developed to prepare soldiers en route to special weapons custodial detachments. Nuclear command and control instruction is also being developed and will be incorporated into appropriate resident courses. The second phase of the instructional segment is to develop and modify lessons to incorporate tactics and techniques evolving from the basic concepts. This will provide instruction on how to employ tactical nuclear weapons on the integrated battlefield to include such staff responsibilities as developing and modifying basic plans in light of existing situations, requesting and implementing release, and exploiting the effects of nuclear strikes with local offensive action. Soldier skills required in this environment will be integrated into individual training. In an effort to incorporate nontechnical instruction now, the Command and General Staff College is initiating a guest speaker program which should be made available to other TRADOC schools through video tapes of each presentation. This guest speaker program will invite senior personnel to discuss nuclear employment policy, NATO concepts for selective employment, air support of integrated operation, and integration of nuclear planning at division, corps and army group level.

The impact of this Action Plan on the field will be profound. The focus of all ARTEPs, FTXs, CPXs, and SQTs will be integrated operations. The intelligence, target acquisition, target attack, and reconnaissance systems required to perform the Battlefield Interdiction mission must be brought together and fused into a cohesive, responsive, integrated system.

As we proceed, feedback from the field will be vital to keep the artillery on track in our efforts to structure and train the Army to fight and win on the integrated nuclear/nonnuclear battlefield. 



If all mankind minus one, were of one opinion, and only one person were of the contrary opinion, mankind would be no more justified in silencing that one person, than he, if he had the power, would be justified in silencing mankind. "On Liberty"—John Stuart Mill

Incoming

letters to the editor

Whence the 105-mm howitzer?

Splendid article by Ms. Janice E. McKenney, "Whence the 105-mm howitzer?" in the May-June issue! Well-written, properly researched, and apparently authentic.

But I have a question about the illustration on page 41 which purports to show two howitzers—"our first 105 model," one being horse drawn, the other being truck drawn. I have no idea what the first 105 looked like, but I have a strong suspicion that the weapons in the illustration are really 75-mm guns, probably the M2A3 model.

Consider the evidence:

- The tubes are too long and too slender for a howitzer.
- Gun rails are clearly visible under both tubes. I don't believe 105s had such rails, but the French 75-mm tubes did.
- A perforated safety shield is dimly visible to the left of the breech which is characteristic of the 75-mm, M2 series. It prevented the gunner's shoulder from getting in the way of the recoiling tube.
- Under a magnifying glass, I believe I can identify a rotating-type breech block rather than the horizontal sliding type used on the 105. The 75s, of course, had the Nordenfeld eccentric screw-type breechblock as the French tubes were unchanged except for the removal of the muzzle rollers.
- Just beyond the near wheel of the near piece I can see what appears to be a wheel segment in the upright, traveling position. These were characteristic of the M2A3 models. The M2A1 and M2A2 used a firing jack to lift the piece off of its wheels rather than wheel segments.

- From the text of the article (page 36) the first 105-mm howitzer, M1, was built in 1921 and apparently tested in 1927. And the M2 was delivered in 1931. The

illustration seems to show equipment and uniforms of 1940-41 vintage.

The M2 series represented the second modernization of the French 75, the first being principally the adaptation to high-speed transport by adding steel disc wheels and pneumatic tires. This was designated the M1897A4, as I recall.

The M2 series was a radical revision which kept nothing of the original French 75 except the tube.

Even if my suspicions are correct and the guns shown are 75s, I think that caption writing has improved considerably since the 1930s when a newspaper caption-writer labeled a parade photo as the "...th field artillery regiment with 75 of their famous millimeter guns."

William R. English
MAJ (Ret), FA (USAR)
Clinton, NY

More on "Whence the 105-mm howitzer?"

The picture on page 41 of the May-June 1979 *Journal* shows two M1897 75-mm guns mounted on the M2 split trail carriage, not "our first 105 model."

The M1897 gun had a Nordenfeld eccentric-screw breech mechanism; the weapons shown certainly do not have horizontal sliding wedges. The M2 carriage had a firing jack allowing 90 degree traverse, not the 85 degrees shown in the table on page 39.

Earlier the M1897 gun had been modified for high speed towing, the M1897A4 version. In this adaptation rubber tires were substituted for artillery wheels, but the original box trails were retained limiting the full range potentiality of 12,780 yards to 9,200 yards.

One gains the impression from the article that the "French 75" was phased out of the inventory shortly after Pearl

Harbor. On the contrary, the M1897 was retained as an antitank weapon, both in this country and in Germany. The latter, having captured considerable quantities of foreign materiel, adapted both the French 75 and the Soviet 76-mm field gun along M2 lines which were respectively known as the 7.5-cm Pak 97/38 and the 7.62-cm Pak 36 (r).

An interesting point about the picture on page 41 is that, as per regulations of that era, the mounted half-section wore field (campaign) hats and the motorized crew garrison caps. My own feeling about the current "cover" crisis is that campaign hats should be authorized for all Army service school instructors (not limited to BIT cadres) and marksmanship units; berets for Special Forces, Rangers, and the Airborne; and everyone else authorized the garrison cap for wear with the fatigue uniform. The new garrison cap should resemble those worn by the Air Force and the Marines: one that does not look like an axe blade, but on the other hand can not be dented in the middle to look like the one worn by PVT Beetle Bailey's "Sarge." Needless to say in this era of SQTs and MOS qualifications both the cap and the hat should have branch coloring (cords and piping), especially with the new gray green shirt uniform coming in, making it impossible otherwise to identify the individual's arm or service.

George A. Rentschler
MAJ, FA (USAR)
New York, NY

Although a correction to Ms. McKenney's article was published in the July-August 1979 issue of the Journal, the material you have provided is interesting and well researched. Thank you for your comments.—Ed.

SEAD

In reading LTC (Ret) Charles W. Montgomery's timely and educational article on SEAD in the May-June 1979 *Journal*, I found that I had a strong philosophical disagreement with one statement. The author says that: "Requests to execute planned (on call) SEAD fires may come from . . . Army aviation via their personnel in the Airspace Management Element."

While I am pleased to see recognition given to the AME, I have difficulty identifying "Army aviation" as an entity on the battlefield. Hence, I am not sure why "Army aviation," as an entity, would be requesting SEAD fires.

On the other hand, I can certainly visualize subordinate maneuver commanders requesting SEAD fires. Such fires would support operations of helicopter units (attack helicopters, air cavalry, and lift helicopters) and even CAS strikes, all of which comprise part of the maneuver commander's combat power. That maneuver commander might command a division, a mechanized brigade, an ACCB, or an air cavalry squadron—but he would be a maneuver commander.

Griffin N. Dodge
COL, FA
Kirtland AFB, NM

Women in MOSs 17B and 17C?

I have followed recent articles in your magazine concerning women in the Army (and particularly the Field Artillery) with keen interest. As a former commander of female enlisted soldiers (the TAB at Fort Stewart) I have the following observations:

- It is my opinion that the Army has made a mistake by permitting women entry into MOSs 17B and 17C.

- 17C is the most varied and physically demanding MOS in the Field Artillery. Not only are sound/flash rangers required to perform MOS unique tasks, but they are also required to perform as fieldwiremen, forward observers, surveyors, meteorologists, chart operators, radar operators, and order of battle specialists. I have found that women do not have the physical stamina to perform these duties in a field environment.

- 17B is another very "physical" MOS that exceeds the physical

capabilities of most women. Anyone who has put up a TPS-25 mast will agree that this operation is tricky with a male crew.

- The presence of women in a field environment is disruptive to operations. The majority of the soldiers in my unit were 18 to 21 years old and the presence of women in the unit created a "high school" atmosphere which detracted from unit performance.

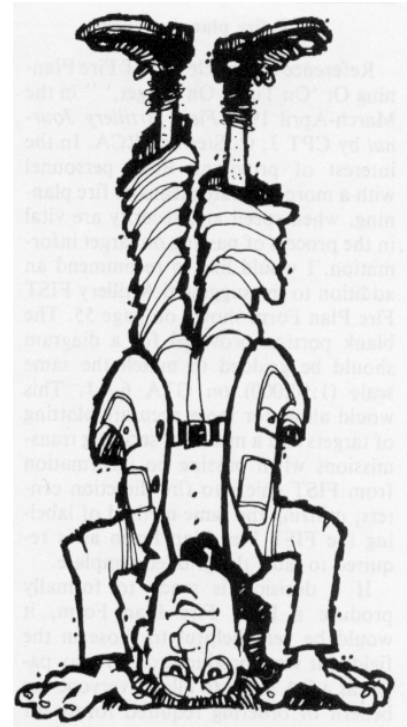
- Medics in HHB have little or no experience in dealing with female soldiers in the field. Approximately 75 to 80 percent of female sick calls in my unit in the field were evacuated for ultimate treatment.

- Placing women in MOSs 17B and 17C, which are the back bone of TABs, presents an undo workload on unit leadership and also creates problems unique in the combat arms.

- Since target acquisition was resurrected several years ago, doctrine and the TAB organization have been evolving. With projected developments, it's a fair bet to say that we are at least three to four years away from fielding a target acquisition organization that will integrate the new generation of equipment and fully support the division. Using TABs as the guinea pigs for integrating women into the combat arms will hinder the unit's progress and is ultimately a mistake.

Daniel A. Jurchenko
CPT, FA
US Army Exchange Officer
Royal Australian School of
Artillery

One of the goals of the Field Artillery School is to ensure that each soldier, regardless of sex, is thoroughly trained and qualified in his/her MOS prior to awarding of that MOS. The School is aware of the physiological differences between men and women and if a soldier, male or female, cannot complete all of the tasks for a certain MOS, then he/she will not be awarded that MOS. Colonel Roberts, Commandant, USA Institute of Administration, indicates that current FA MOSs open to women will not be closed by DA any time in the near future. Down the pike, it is possible that DA will establish physical strength requirements by MOS but, until such time, enlistees who meet the present established prerequisites will be allowed to enlist for FA MOSs, regardless of sex or physical strength.—Ed.



Upside down headline

The July-August '79 issue provided some interesting and instructive reading—as do your other issues.

One nit to pick: Captain Lyon's article on page 26 has some strange symbols at the top of the page. At first I thought it must be some new TACFIRE computer language, but later turned the page upside down. If one does that it reads "Hwa-ryok tong hap hoolyon." Sure enough that's "fire power-integrated training." A good article and a good issue. Keep up the good work, but get an editor that can read Korean if you're going to use it.

John W. Vessey, Jr.
General, USA
Vice Chief of Staff,
US Army

As the redness slowly clears my face, I thank you Sir for pointing out our error. I now know for sure what they meant at OCS by "attention to detail."

The headline for Captain Lyon's article should have appeared as follows:

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—Ed.

Incoming

FIST fire planning form

Reference the article "FIST Fire Planning Or 'On Time, On Target,'" in the March-April 1979 *Field Artillery Journal* by CPT J. C. Stewart, RCA. In the interest of providing FIST personnel with a more accurate means of fire planning, when speed and security are vital in the process of passing on target information, I would like to recommend an addition to the suggested Artillery FIST Fire Plan Form shown on page 55. The blank portion provided for a diagram should be gridded to match the same scale (1:50,000) on GTA 6-4-1. This would allow for more accurate plotting of targets and a means of securing transmissions when passing on information from FIST chiefs to fire direction centers, utilizing the same method of labeling the FIST Fire Plan Form as is required to label the gridded template.

If a decision is made to formally produce a FIST Fire Plan Form, it would be very helpful to those in the field if it were produced on overlay paper as a DA Form to allow everyone the benefit of ordering required forms for training through normal publications channels.

Jack M. Green
SFC, 1-178th FA,
SCARNG
Greer, SC

As pointed out by Captain Stewart, the Artillery FIST Fire Plan Form introduced in his article is only a guide to "help streamline radio transmissions and organize thoughts." As such, there are no plans to produce it as a DA form and users are encouraged to modify it in any way they see fit. This includes reproduction on overlay paper and modifying the diagram block to 1:50,000.

The School, however, cautions users against using this gridded overlay as a rough and ready gridded template; first, because the Army Security Agency has declared the gridded thrustline method of transmitting locations to be insecure, and, second, because of the additional time required to encode and decode targets in a time critical situation. Keep in mind that FIST fire planning will probably be used in situations where contact has been made, so we can't reasonably expect to surprise the enemy. What we can do is use the limited time available to reduce the effectiveness of his defense with adjusted fires that will pin him down because they are "on target" at the right time! This is not to say that we

should throw away the advantage of surprise by transmitting grids in the clear or adjusting fire on unsuspecting enemy positions just to insure rounds "on target." Indeed, we may well have to encode target grids and attempt predicted fires if the maneuver commander decides that advantages offered by surprise outweigh the disadvantages. Should this happen, though, we should use an accepted encoding procedure.—Ed.

Automatic fuze setting?

At the conclusion of his article "Development of Point Detonating Fuzes" (March-April 1979 *Journal*) Captain DeTreville made some predictions about the future of field artillery point detonating fuzes. He concludes that "the trend is toward multi-purpose electronic fuzes. . . . It seems only a matter of time until the Field Artillery will have a similar all-purpose fuze set electronically by FADAC or TACFIRE."

The idea of automatic fuze setting has not escaped the attention of the development community. Prototype hardware for automatically setting the new M587 and M724 electronic time fuzes from a battery computer has been available since 1977. This system was proved feasible in HELBAT VI and further evaluated in the recent HELBAT VII. Results of those tests indicate that electronic fuzes are easier and significantly faster to set than mechanical fuzes and that auto setting of electronic fuzes saves an additional four to six seconds. This may seem insignificant now, but it could be a significant portion of the time budget for future auto-load weapons.

Other advantages of "removing man from the loop" have been suggested. Auto setting should reduce human error. Transfer of setting data by voice communications under combat conditions is a potential error source. Auto setting would also reduce the difficulties associated with setting under adverse conditions (e.g., night, arctic, noisy battlefield).

Don't throw away your setting wrenches yet, but look for the automatic fuze setting feature to proliferate in future field artillery systems.

Darrell W. Neily
Mechanical Engineer
USA Harry Diamond
Laboratories/ERADCOM

Appreciate your comments and interest in the Journal.—Ed.

Defending the battery

With regards to my article "Defending the Battery" (*Field Artillery Journal* May-June 1979), under "Antiarmor Defense Possible Quick Fixes," my intent was to have one of the two .50 caliber machineguns in *each* howitzer section replaced by an automatic cannon. The paragraph should read "Upgrade one of the howitzer section's .50 caliber machineguns to a 20-mm to 30-mm automatic cannon. . . ." A battery armed under my proposed antiarmor/ADA weapons structure would be as follows:

- Eight M109 howitzers in two 4-gun platoons.
- Eight automatic cannons (one per howitzer).
- Four 40-mm high velocity grenade launchers on M548s (two per platoon).
- Two 7.62-mm miniguns on M548s (one per platoon).
- Four 3-tube 2.75 inch FFAR pods on .50 cal tripods (two per platoon).
- Two .50 caliber machineguns on M548s (replaceable by miniguns or HVGLs).
- Eight 7- or 19-tube rocket pods (one per howitzer).
- Two 7-tube rocket pods (one per FDC/BOC).

Remember one thing: when we go to the 4-gun platoon system we cut manpower in half and firepower by one-third *compared to a 6-gun battery position*. Overall battery and battalion firepower is increased but individual firing platoons are much weaker. The need for organic antiarmor/ADA weapons to meet our self-defense requirements is evident.

Larry A. Altersitz
CPT, FA, NJARNG
1st Bn, 112th FA
Cherry Hill, NJ

Reunion

The 108th Field Artillery World War I Veterans Association will hold its 46th annual reunion 27 October in Philadelphia, PA. Contact COL James D. Campbell, 1045 Sunset Drive, Blue Bell, PA 19422.

Results of the 1979 Readership Survey

At the outset of this report the *Journal* staff extends appreciation to the more than 500 respondents who completed and returned the 1979 Readership Survey. Results have been consolidated and reviewed and letters have been forwarded to those readers who indicated either interest in writing for the *Journal* or required response to specific questions.

Overall, survey results are much the same as those tabulated last year. A breakout of our readership shows that 50 percent are Active Army, 22 percent National Guard, 9 percent Army Reserve, 6 percent retired, and 5 percent US Marine Corps. Commissioned/Warrant officers comprise 78 percent of our readers, noncommissioned officers 17 percent, and junior enlisted grades 5 percent. Somewhat less than half of our respondents (41 percent) are in cannon assignments with only 3 percent in missile units. Seventy percent have college degrees of which 33 percent are graduate level.

Identical to 1978, the survey indicates 80 percent of *Journal* readership read most of the articles while 38 percent read the magazine cover to cover. Overall content was rated "highly useful" by 57 percent and "moderately useful" by 35 percent. The *Journal* was rated "better than most" similar military publications by 62 percent and "about the same" by 29 percent. Reading ease, layout, and design showed some improvement, and 90 percent of our readers indicated the *Journal* has continued to provide a media forum for artillerymen worldwide.

Insofar as the magazine's feature sections, "FA Test and Development" and "Right by Piece" tied for first in popularity. "View from the Blockhouse," "Redleg Newsletter," "Comrades," "Commanders Update," and "On the Move . . ." were next in order of readership appeal.

The "big four" articles for the year were "We've Got 30" by MAJ William Whelihan, "Defending the Battery" by CPT Larry Altersitz, "Whence the 105-mm Howitzer" by Ms. Janice McKenney, and "Lance and the HHC" by SFC Shelton Alsup. It's quite interesting to note that all four articles appeared in the May-June 1979 issue which also contained the readership survey.

According to our readers, areas of interest which they would like to see expanded in the *Journal* include: FA tactics, technique and organization; weapons and equipment; foreign armies; future concepts; history; and strategy. These recommendations should be of special interest to those readers who indicated a desire to contribute to the *Journal*.

Section 17 of the survey provided space for general comments and for recommendations to improve the *Journal*. Some opinions were expressed often; some only once. The following are a few of the candid remarks:

- Need more input from enlisted authors.
- More coverage of the Reserve and National Guard.
- More from sister branches.
- Stay away from maintenance oriented articles.
- Too many acronyms.
- More updates on career information.
- Do away with "Redleg Review."
- More on FA survey.
- Less emphasis on officer related subjects.
- More photographs and art.
- Need more input from the "field."
- More humor.
- Get personal subscriptions out faster than distribution to units.

Relating to the above, the *Journal* can only publish what it receives. We certainly appreciate and recognize the importance of each comment and encourage submission of material from all readers, whether private or general officer, Active Army or Reserve Component, sister services, civilians, or members of our retired community. Content, character, and value of the magazine depend primarily on active participation in the *Journal* by our readership—and that's the truth.

Again, the *Journal* staff thanks our readership for your continued support and in particular those of you who took time to respond to the Readership Survey.



Artillery Scatterable Mines

by MAJ Bohdan Prehar

CHECK FIRE!

Like it or not, the field artillery is in the minelaying business—no longer is this the sole responsibility of the Corps of Engineers. The new family of scatterable mines (FASCAM), to be fielded soon, has added an unprecedented dimension to the modern battlefield and, with it, a host of new challenges.

This article addresses the characteristics, concepts of use, and emerging problem areas of scatterable mines (SM) and, hopefully, will generate the interest necessary to bring this subject the attention it deserves.

Characteristics

There are two types of artillery scatterable mines: M692/M731 Area Denial Artillery Munitions (ADAM) and M718/M741 Remotely Activated Antitank Mine System (RAAM). The general characteristics of each are shown in table 1. Each round is a base ejection projectile which uses the mechanical time fuze M577. Registration is performed by using the dual-purpose improved conventional munitions (DP-ICM) M483A1 round in the self-registration mode. Fire direction procedures are similar to those used for DP-ICM. Both artillery SMs have a self-destruct capability and a percentage of each has an anti-disturbance feature. (Specific destruct times are classified.) The AP mines arm within a few seconds of hitting the ground, where trip lines are deployed in a circular pattern and, when disturbed, eject the mine into the air causing it to explode. The antitank (AT) mine contains a magnetic influence fuze and is capable of penetrating most parts of a tank, causing a total kill.

Table 1. Artillery scatterable mine characteristics.

Characteristics	Antipersonnel projectile (M692/M731)	Antitank projectile (M718/M741)
Range.....	2 to 18 kilometers.....	2 to 18 kilometers
Number of mines.....	36 (1 pound each).....	9 (5 pounds each)
Target effect.....	Personnel casualties..... Damage to light vehicles	Destroy/damage armored vehicles
Standard size.....	350 × 350 meters.....	175×175 meters (low angle) 350×350 meters (high angle)
Function.....	Trip line/anti-disturbance.....	Magnetic

Fire planning

Fire planning for artillery SMs must be closely coordinated with operations, maneuver, and engineer personnel. The use of SMs must complement the scheme of maneuver and tie in with the overall obstacle plan. This type of interaction is normally accomplished at division and brigade levels by the fire support elements (FSE).

The FSE's job is to receive, analyze, and act upon artillery SM requests. This requires technical analysis as well as assigning priority of fires and designating which units are to shoot in the minefield. The following example illustrates the factors involved in an artillery SM request:

• G3/engineer requirement:

Minefield size.....	600 by 350 meters
Location.....	AB34201521-AB34801530
Density.....	0.001
Destruct time.....	± 24 hours
Type minefield.....	AT
Emplacement time.....	150900 hours

• FSE planning data:

Range-map inspection.....	12,000 meters
Mine angle-map inspection.....	600 mils
Type fire.....	High angle
FDC technique.....	Registration and transfer
Aiming points.....	3
Rounds per aiming point.....	16
Total AT projectiles.....	48

• Firing data to delivery unit:

Target number(s) and grid(s)...	F100, F101, F102
Method of engagement.....	AT, 16 SM
Self-destruct time.....	± 24 hours
Control.....	TOT 0900 hours

The above information is derived from fire planning tables. Once the artillery SMs are fired, the FSE forwards as-fired data to the G3/engineer who must keep track of all emplaced minefields and evaluate their coverage. This is accomplished through the use of firing reports and engineering employment tables. Post firing analysis allows the determination of the minefield center of mass and closes the loop in the coordinated fire planning process.

As one can see from the example above, minefields require significant quantities of ammunition; therefore, FSE personnel as well as firing units must exercise technical and tactical judgment to insure use of the best option.

Table 2. Battery basic load (Division War Game Model).

Projectile	Number	Percent
HE.....	156.....	14.9
CLGP.....	42.....	4.0
RAP.....	108.....	10.3
ICM:		
AP.....	54.....	5.1
DP.....	570.....	54.3
FASCAM:		
AT.....	90.....	8.6
AP.....	18.....	1.7
SMOKE.....	12.....	1.1

Employment

The authority to employ minefields, to include use of artillery SMs, is normally vested in division and brigade commanders; however, it may be delegated to battalion level. Centralized control is necessary to prevent the proliferation of mines across the battlefield which could impede friendly movement. In other words, units do not have "carte blanche" authority to use artillery SMs.

Artillery SMs are classified as dynamic, reinforcing obstacles—dynamic because they are rapidly emplaced and reinforcing because they are used in response to the battle. As such, artillery SMs are employed mainly for point minefields to disorganize the enemy, force him to deploy in a favorable area, and prevent his use of key areas. They also provide a means of developing targets for long-range antitank weapons.

Point minefields are generally less than 1,000 meters in width and are generally of irregular size and shape, ranging from a single group of mines to successive mined areas, placed along major lines of communication and avenues of approach. Numerous small obstacles prove more effective than large ones, and they create the same psychological impact, force the enemy into breaching operations, and are less time-consuming and expensive.

One primary purpose of all obstacles is to enhance weapon effectiveness. Some war games show that obstacles can increase the kill probability of antitank weapons by as much as eight times by keeping the target in the optimum killing range as long as possible. A recent test using the Division War Game Model in a European scenario showed that Blue forces augmented with FASCAM delayed Red forces six hours more than in a base game. A surprising conclusion was that artillery SMs were significantly more responsive, economical, and effective than any other SM delivery system.

Note: Currently there are seven scatterable mine systems: M56 helicopter mine system, M70/73 artillery delivered AT mine, M67/72 artillery delivered AP mine, ground emplaced mine scattering system (GEMSS), rocket delivered mine (SLUMINE), tactical aircraft (GATOR), and modular pack mine system (MOPMS).

Artillery SMs can be used in an offensive or a defensive role (figures 1 and 2). In essence, the artillery SM allows field commanders to control forward, lateral, and rearward movement on the battlefield. This, coupled with its standoff and reliability, makes the artillery SM potentially the most effective minelaying system in the Army's inventory.

Minefield employment planning is the staff responsibility of the G3; however, the staff engineer develops obstacle plans, makes recommendations on the types of obstacles to use, determines densities, allocates resources, computes destruct times, etc. The artillery provides technical advice

and required support. To this extent, the interaction between units, staff, and artillery is no different from that required for conventional fire support. The difference is in the execution, and this is where the artillery needs to focus its attention.

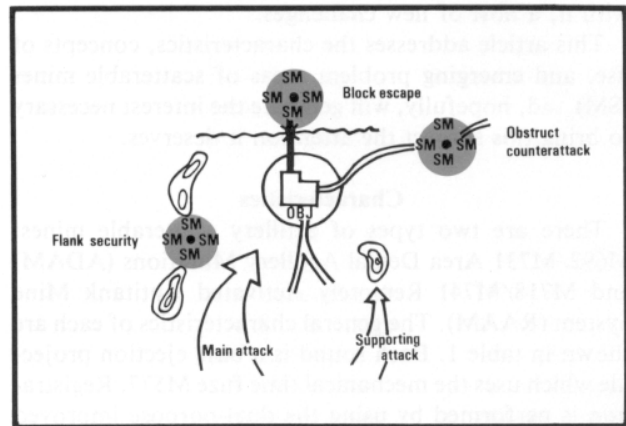


Figure 1. Offense.

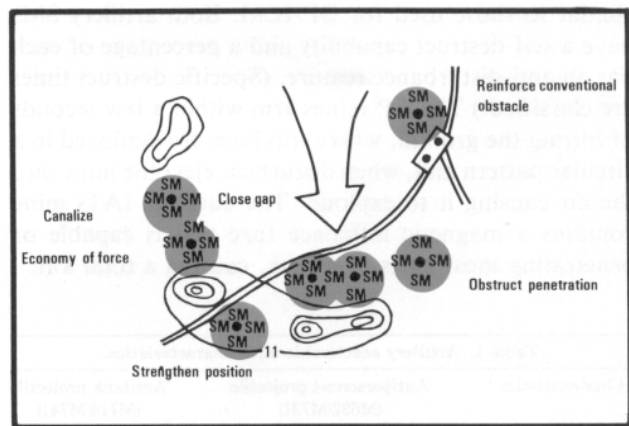


Figure 2. Defense.

Shortfalls

The Artillery Community has been relatively silent on artillery SMs; in fact, there is no artillery publication that adequately covers SM tactical and fire planning aspects. The Artillery and Engineer Schools have been working for nearly two years on an artillery SM training circular which is still in draft form.

Direct support units

One of the most important issues today is the direct support (DS) role of 155-mm units. Should DS units be involved in shooting minefields or laying mines? Minefields require time and a large amount of ammunition which necessitates "beefed up" basic loads, not to mention the obvious signature that is created during the firing. In an active defense environment, displacement

and mobility are keys to survival and effective fire support. The Division War Game Model shows that DS units can expect to fire two-thirds of the artillery SM missions. Would it not be better to have general support reinforcing units primarily devoted to shooting SM fire missions? Perhaps dedicated batteries would even be better since these units are not as critically positioned, are closer to existing supply lines, and are more responsive to centralized control. If DS units are used to emplace minefields, their attrition rates will increase and conventional fire support will be degraded. Conversely, the DS units may be best suited to use artillery SMs, in that artillery SMs are more efficient and effective tank killing systems than either tanks or TOWs. After all, mines attack a tank in its most vulnerable spot—the belly. Artillery SMs are cheaper and, with their standoff capability, can engage a tank without being exposed. Using SMs in an active rather than a passive role may be the direction we need to go with our DS units.

Supply

With demands for artillery SMs being generated from all levels, delivery units' carrying capacities will be tasked. What then should the artillery SM basic load be? The design of artillery SMs further complicate the situation. Self-destruct times are preset at the factory. Thus, units must decide what AP and AT mix to request and the number of short versus long self-destruct projectiles. What is needed is an optional dial for each SM. Units currently require anywhere from 8 to 15 percent of their basic load in SMs to meet the minimum minefield requirements. The Division War Game Model used a battery basic load as shown in table 2. This allocation was based on unrestricted use of artillery SMs and the assumption that the basic load would be replenished. What will dictate the basic

load configuration is *firm doctrine* on the use of artillery SMs. Without this, we "assume" our way out of reality.

Command and control

The authority to emplace minefields is rigidly controlled; however our How to Fight manuals advocate decentralized execution. Artillery units cannot fire SM missions without release authority. Current thinking in this area is that mines with long self-destruct times will remain under the control of the division and those with short times under the control of the brigade. Quick fire channels will have to be established to insure responsive support. The trade-off between control and timeliness needs additional attention.

Conclusion

Artillery SMs have the potential of being the most used ammunition on the modern battlefield; therefore, the artillery must be capable of accommodating this challenge. We must address the subject of SMs more aggressively because the Artillery is in the minelaying business to stay! ☒

In addition to the employment of artillery scatterable mines in the traditional minefield role as described by the author, the Artillery and Engineer Schools have begun development of doctrine and employment concepts for employing artillery SMs as munitions against targets of opportunity (e.g., counterfire).—Ed.

MAJ Bohdan Prehar is Assistant G1, Headquarters, III Corps, Fort Hood, TX.

Danger!

Two soldiers were killed last year by the atomic explosion simulator M142. The device is a 55-gallon steel drum with an inner drum which houses a smoke charge, sound unit, and electrical cables. The simulator, weighing 200 pounds, is white with black markings and a brown band. It produces a fireball with a minimum diameter of 10 feet. The sound charge produces an explosion, flash, and loud noise.

Proper use of the simulator is to remove the sound unit and place it downwind the length of its electrical cable. Insure that the area is clear and attach alligator clips on the free end of the firing cable to a battery or blasting machine. When detonation occurs, a loud noise and a mushroom-shape cloud result. If it does not function, WAIT at least 30 MINUTES before approaching the simulator.

Filling the g – a – p – s in transfer limits

by SFC Peter Ives Jr.

In future conflicts we can expect to encounter the problem of covering large divisional fronts with limited amounts of artillery. To provide this coverage units must have the capability to accurately deliver fires into the left and right sectors in addition to the primary sector of fire. Currently one solution to covering more than one sector of fire is through application of the 8-Directional Met Technique. This technique is acceptable at ranges not exceeding 10,000 meters; however, it is less than sufficient for ranges of 20,000 and 30,000 meters.

Transfer limits at present are 400 mils on either side of the direction of fire for which they were computed to a range of 10,000 meters. Beyond 10,000 meters the limits are 4,000 meters either side of the direction of fire. This however creates a problem at greater ranges; i.e., 400 mils equals 8,000 meters at a range of 20,000 meters but equals 12,000 meters at a range of 30,000 meters. Since the transfer limits are only 4,000 meters either side of the direction of fire at these ranges there are large areas left uncovered by valid GFT settings (figure 1).

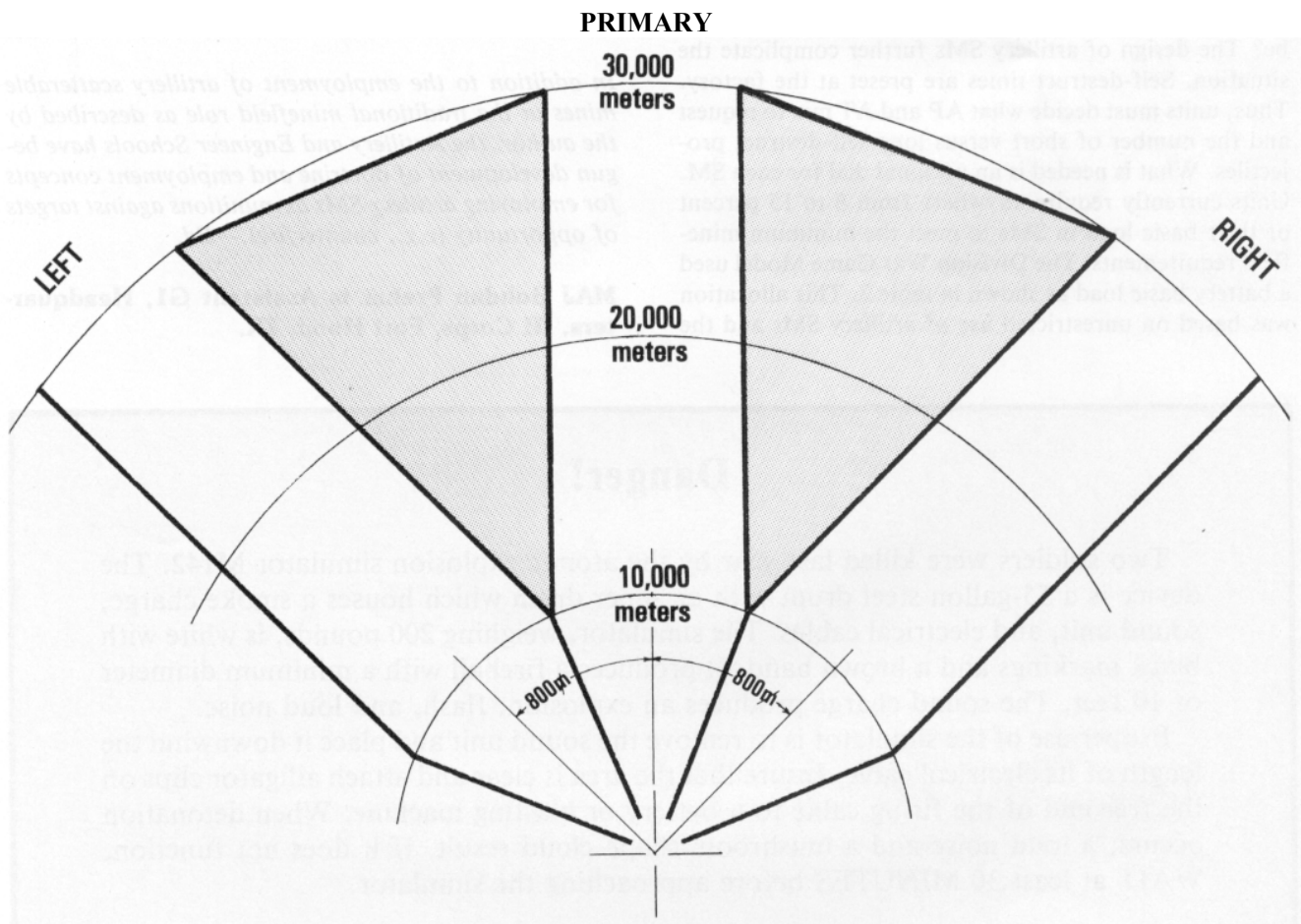


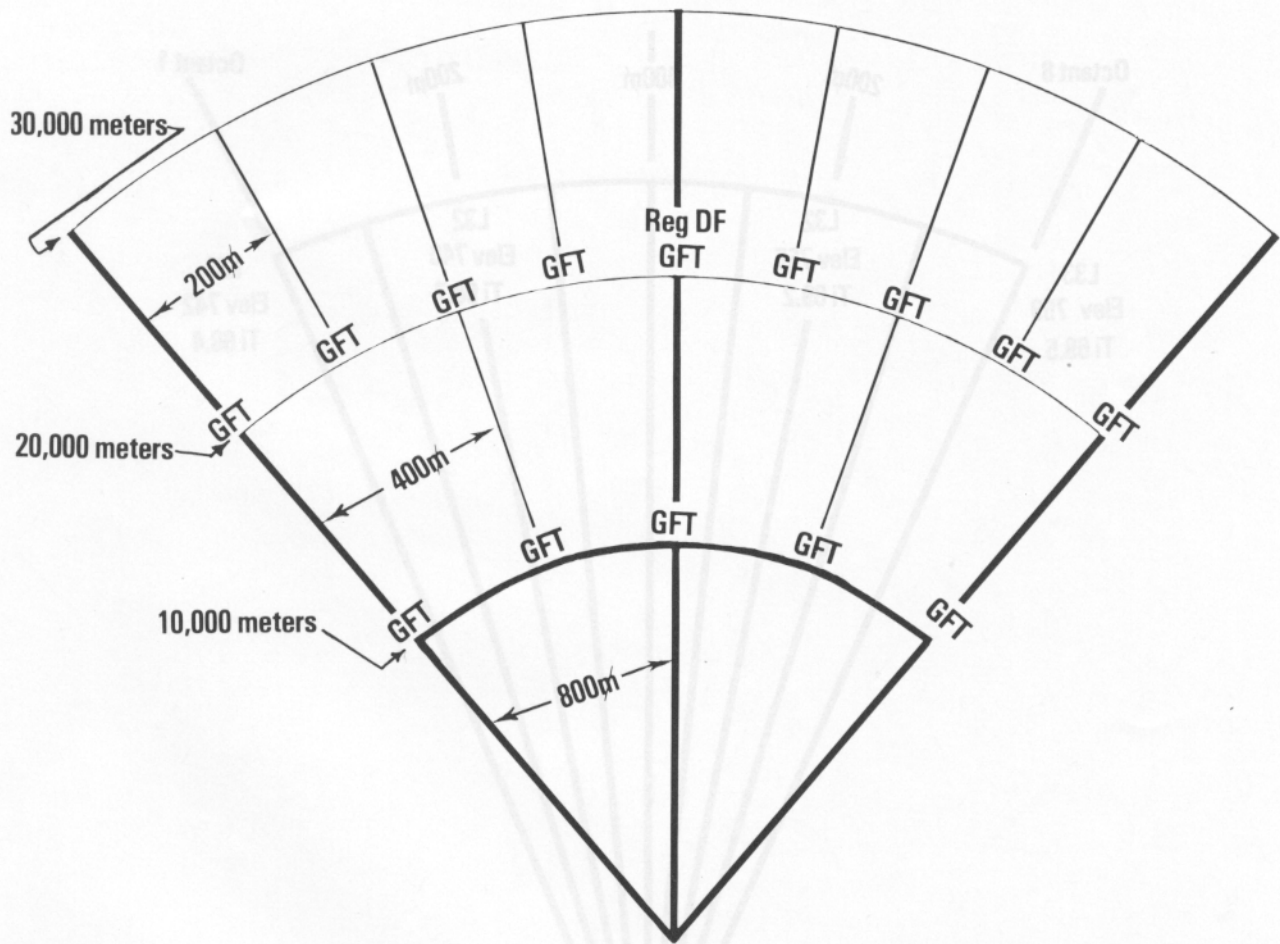
Figure 1.

Covering the gaps created by the present transfer limits would require working 16 Met Data Correction Sheets (DA Form 4200) at a range of 20,000 meters and 32 at a range of 30,000 meters. Based on a computational time of approximately 8 to 10 minutes per correction sheet, it would be impossible to compute the met data necessary to cover all the gaps within a reasonable amount of time.

Another solution would require the computation of met data to a target every time a target is plotted outside transfer limits. This would suffice for targets in the preplanned category but would not be sufficiently responsive for targets of opportunity which require immediate fires.

Within current transfer limits we have a 50:50 percent chance of the target being outside transfer limits at a range of 20,000 meters and a 66 2/3:33 1/3 percent chance of the target being outside at a range of 30,000 meters. To cover all areas using the current transfer limits for ranges greater than 10,000 meters (4,000 meters either side of the direction of fire), it will be necessary to have a GFT setting every 400 mils at ranges from 10,000 to 20,000 meters and a GFT setting every 200 mils at ranges from 20,000 to 30,000 meters (figure 2).

Some means must be available to cover these "other" areas. A possible solution is utilizing a proportional averaging between two computed GFT settings. This is accomplished as follows:



Note. 4,000 meters = 400 mils at 10,000
 4,000 meters = 200 mils at 20,000
 4,000 meters = 100 mils at 40,000

Figure 2.

a. Determine the difference in GFT settings between the two octants involved at a range of 20,000 meters (figure 3); i.e.,

<u>Octant</u>	<u>Deflection correction</u>	<u>Elevation</u>	<u>Time</u>
1	L31	742	68.4
8	L33	759	69.5
<hr/>			
Difference	2	17	1.1

b. Construct a diagram showing the GFT settings from the two octants in an upper and lower case:

Lower	L31	742	68.4	(Octant 1)
200 mils				
400 mils				
600 mils				
Upper	L33	759	69.5	(Octant 8)

c. Multiply the correction factor times the difference to determine the change in the GFT settings (change = factor × difference). For ranges 10,000 to 19,999 a factor of 0.5 is used to determine a GFT setting at 400 mils. For ranges 20,000 to 30,000 factors of 0.25, 0.50 and 0.75 are used for 200 mils, 400 mils, and 600 mils, respectively.

**RANGE 20,000 METERS, 8-INCH, CHARGE 8 ACTUAL
GFT SETTING: L32, ELEV 750, Ti 69.0 DETERMINED
AVERAGE GFT SETTING: L32, ELEV 750, Ti 69.0.**

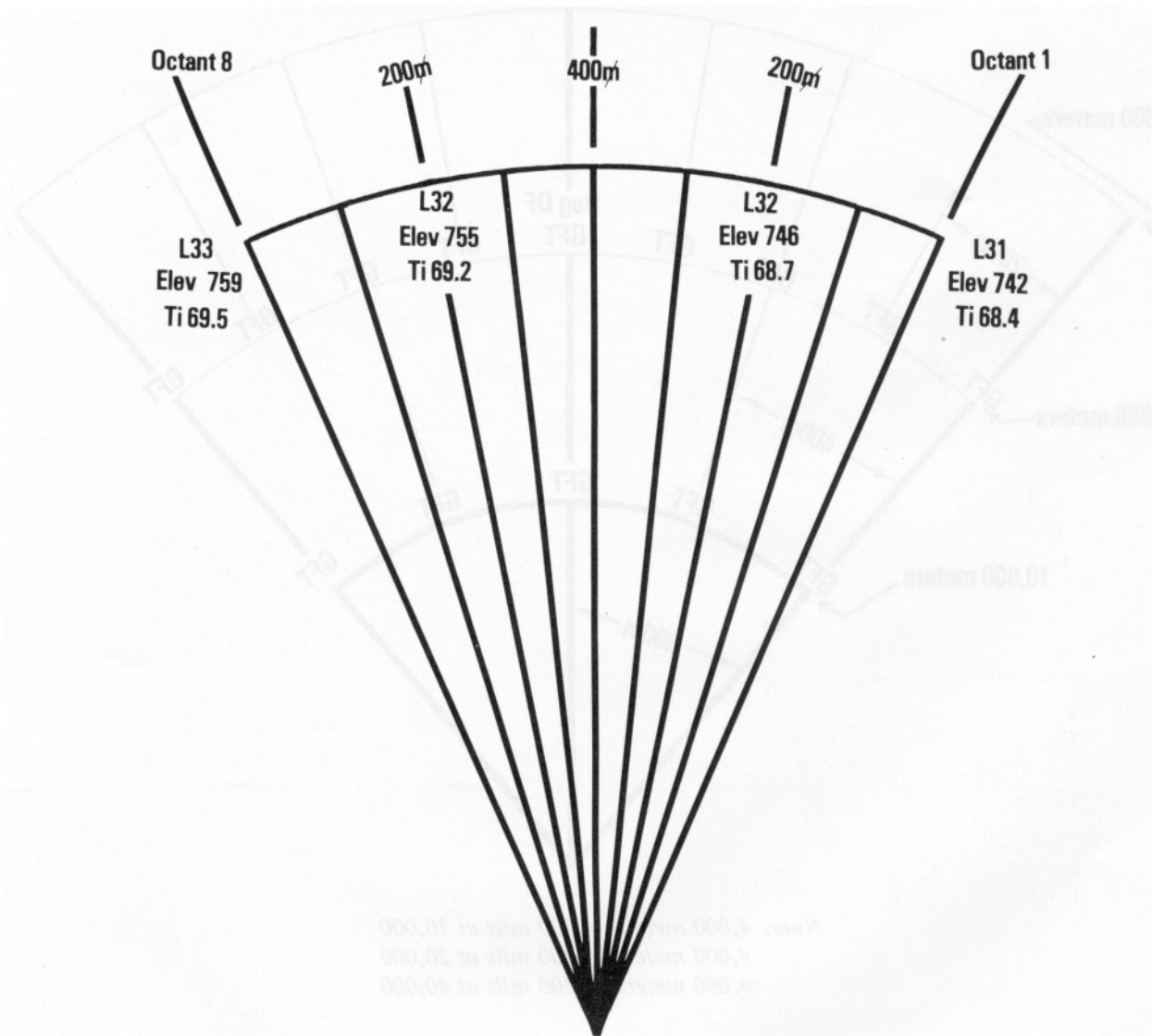


Figure 3.

Difference	Deflection (2)	Elevation (17)	Time (1.1)
200 mils	$0.25 \times 2 = 0.5$	$0.25 \times 17 = 4.25$	$0.25 \times 1.1 = 0.275$
400 mils	$0.50 \times 2 = 1.0$	$0.50 \times 17 = 8.25$	$0.40 \times 1.1 = 0.55$
600 mils	$0.75 \times 2 = 1.5$	$0.75 \times 17 = 12.75$	$0.75 \times 1.1 = 0.825$

Note. Once the values for 0.25 and 0.50 have been determined, their sum will equal the product of 0.75.

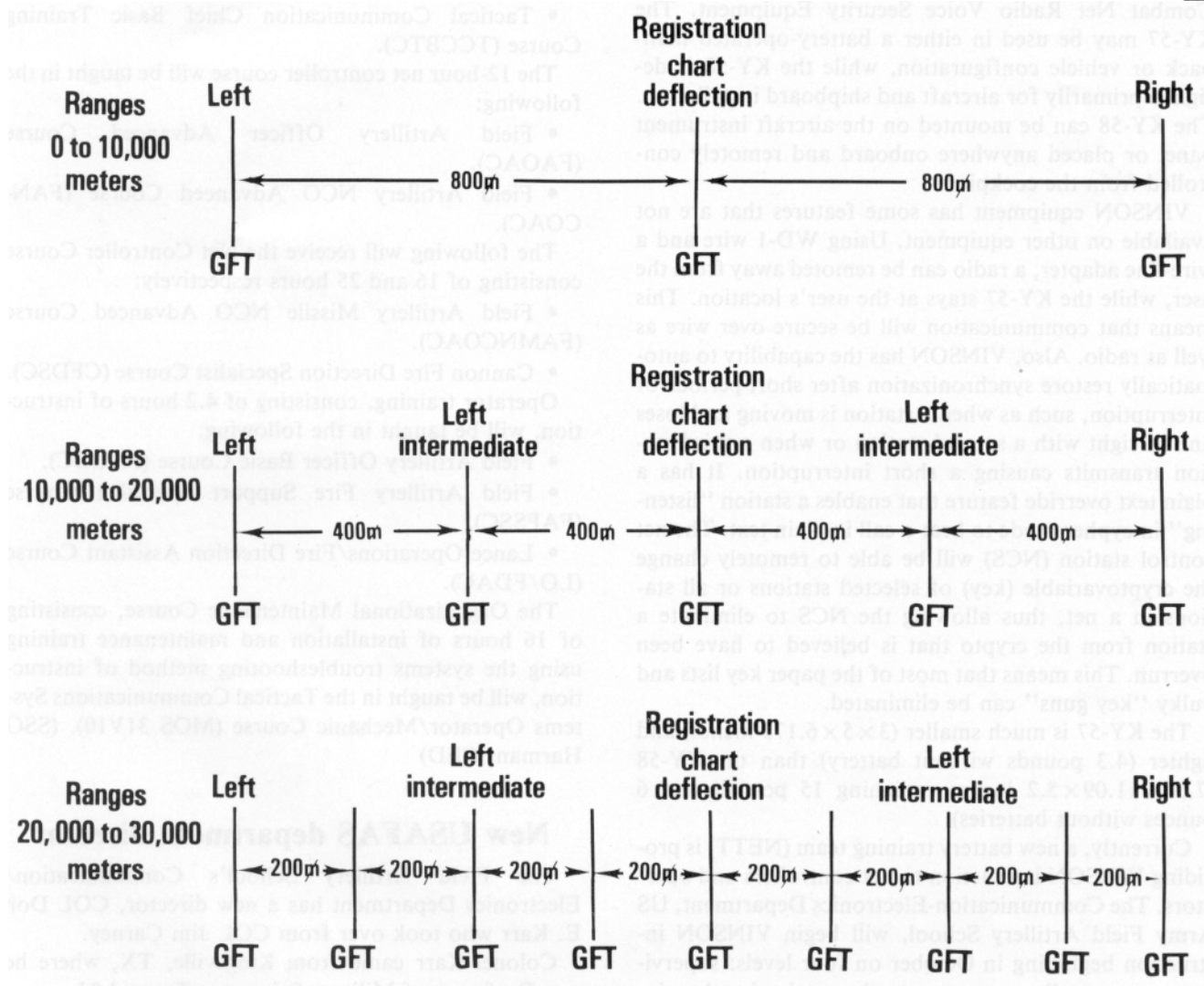
d. Using the rules for artillery expression, apply the products of the factors to the lower end of the GFT setting diagram and complete the diagram:

Lower	L31	742	68.4 (Octant 1)
200 mils(0.25)	L32	746	68.7
400 mils(0.50)	L32	750	69.0
600 mils(0.75)	L32	755	69.2
Upper	L33	759	69.5 (Octant 8)

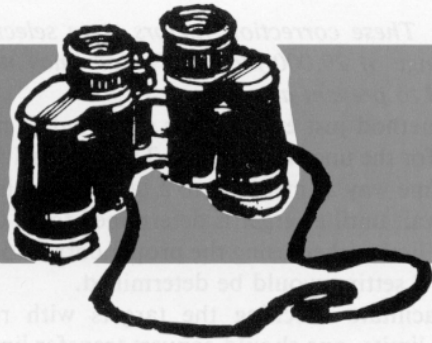
Note. These correction factors were selected based on a range of 20,000 meters. Factors may need to be changed to prevent any gaps.

The method just explained is a preventive method to correct for the uncovered areas. The alternative is to use it the same way as met data to a target. In this case you would wait until a target is determined to be outside of transfer limits; then using the proper correction factor a new GFT setting would be determined.

To facilitate checking the targets with respect to transfer limits, one should convert transfer limits to deflection instead of meters left and right. This would allow the construction of a transfer limit T, similar to a safety T diagram. At present there is no efficient way to check whether a target is in or out of transfer limits.



SFC Peter Ives Jr. is the Training Development Project NCO in the Research and Analysis Division of the Gunnery Department, USAFAS.



View From The Blockhouse

notes from the school

VINSON communication security equipment

VINSON is the name given to the KY-57 and KY-58 Combat Net Radio Voice Security Equipment. The KY-57 may be used in either a battery-operated manpack or vehicle configuration, while the KY-58 is designed primarily for aircraft and shipboard installation. The KY-58 can be mounted on the aircraft instrument panel or placed anywhere onboard and remotely controlled from the cockpit.

VINSON equipment has some features that are not available on other equipment. Using WD-1 wire and a wire-line adapter, a radio can be remoted away from the user, while the KY-57 stays at the user's location. This means that communication will be secure over wire as well as radio. Also, VINSON has the capability to automatically restore synchronization after short periods of interruption, such as when a station is moving and loses line of sight with a second station or when a third station transmits causing a short interruption. It has a plain text override feature that enables a station "listening" in cypher mode to hear a call in plain text. The net control station (NCS) will be able to remotely change the cryptovisible (key) of selected stations or all stations in a net, thus allowing the NCS to eliminate a station from the crypto that is believed to have been overrun. This means that most of the paper key lists and bulky "key guns" can be eliminated.

The KY-57 is much smaller ($3 \times 5 \times 6.173$ inches) and lighter (4.3 pounds without battery) than the KY-58 ($7.56 \times 11.09 \times 5.2$ inches, weighing 15 pounds and 6 ounces without batteries).

Currently, a new battery training team (NETT) is providing VINSON instruction to net controllers and operators. The Communication-Electronics Department, US Army Field Artillery School, will begin VINSON instruction beginning in October on four levels: supervisor, net controller, operator, and organizational maintenance.

The 16-hour supervisor course will be instructed in the following:

- Communication-Electronics Staff Officer Course (CESOC).
- Tactical Communication Chief Advanced Course (TCCAC).
- Tactical Communication Chief Basic Training Course (TCCBTC).

The 12-hour net controller course will be taught in the following:

- Field Artillery Officer Advanced Course (FAOAC).
- Field Artillery NCO Advanced Course (FAN-COAC).

The following will receive the Net Controller Course consisting of 16 and 25 hours respectively:

- Field Artillery Missile NCO Advanced Course (FAMNCOAC).
- Cannon Fire Direction Specialist Course (CFDSC).

Operator training, consisting of 4.2 hours of instruction, will be taught in the following:

- Field Artillery Officer Basic Course (FAOBC).
- Field Artillery Fire Support Specialist Course (FAFSSC).
- Lance Operations/Fire Direction Assistant Course (LO/FDAC).

The Organizational Maintenance Course, consisting of 16 hours of installation and maintenance training using the systems troubleshooting method of instruction, will be taught in the Tactical Communications Systems Operator/Mechanic Course (MOS 31V10). (SSG Harman, CED)

New USAFAS department director

The Field Artillery School's Communication/Electronics Department has a new director, COL Don E. Karr who took over from COL Jim Carney.

Colonel Karr came from Kingsville, TX, where he was Professor of Military Science at Texas A&I.

Colonel Carney has been assigned to the 5th Signal Command with duty station ODCSCE, Heidelberg, Germany.

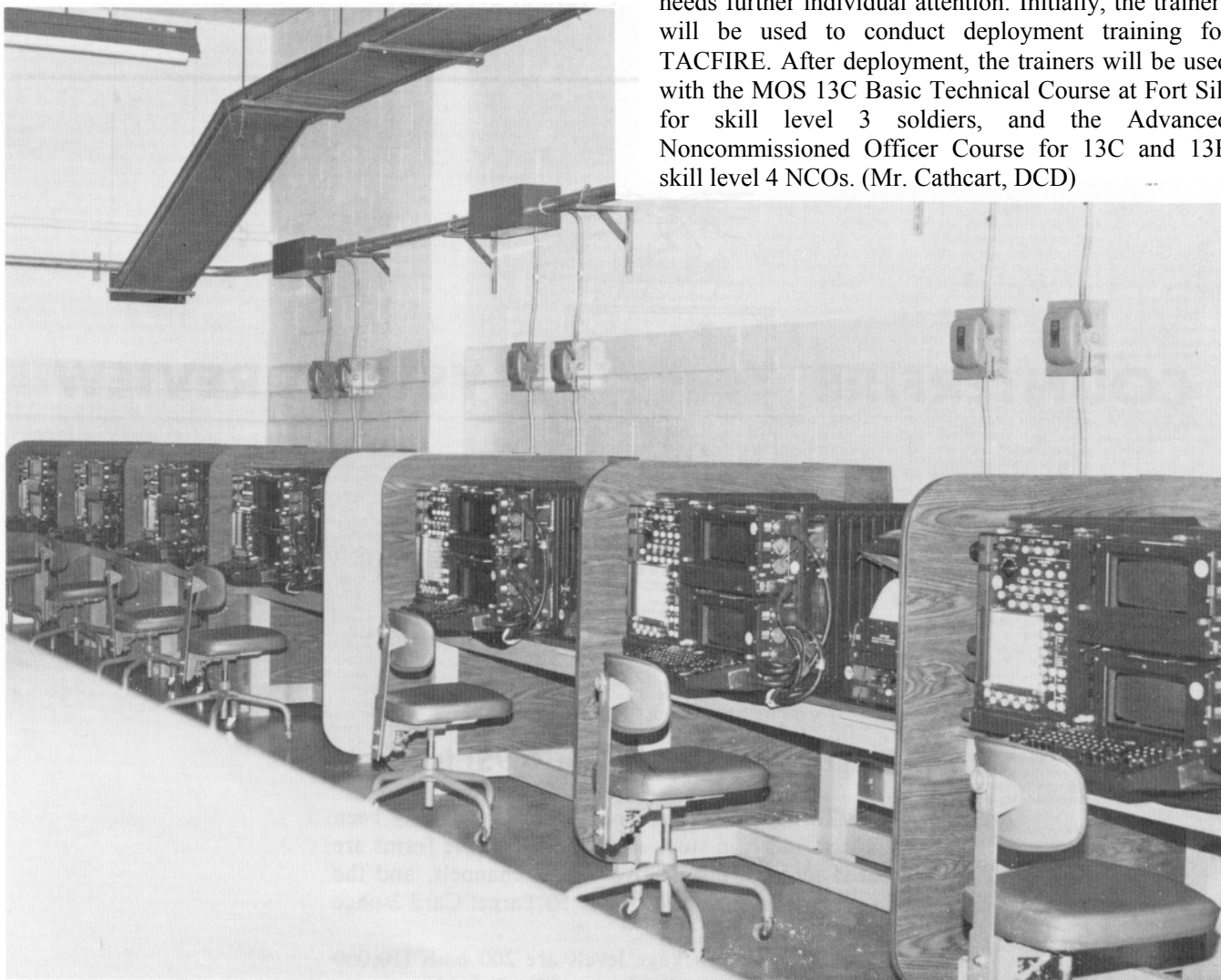
Simulated containers for nuclear 155-mm and 8-inch projectiles

The need for exact replicas of 155-mm and 8-inch nuclear projectile containers in quantities sufficient to simulate prescribed nuclear load (PNL) for realistic training and evaluation of FA units under change 1, ARTEP 6-165 and 6-635 is recognized. Plans were developed by the Fort Sill Training and Audiovisual Support Center (TASC) to insure that the required training items are built to actual scale, properly ballasted, and meet all requirements related to transportation and tiedown procedures.

Plans and descriptive data were reproduced and distributed by ATSC Logistics Office to TASC Army-wide for fabrication on an as required basis. USAFAS notified all units concerned that simulated containers may be ordered from their supporting TASC.

TACFIRE Training System Arrives at Fort Sill

The first of three TACFIRE Training Systems arrived at Fort Sill in July. The trainer has a capability of eight artillery control consoles and six variable format message entry devices (VFMEDs) on line at one time per computer. Normally, a tactical system has only one console and five VFMEDs associated with it. A second training system is programmed for USAFAS in September, and a third should be delivered to USAREUR early 1980. The trainers add increased hands-on time for students learning to operate TACFIRE by computer assisted instruction. The device teaches lessons, conducts refresher training exercises, and advises the instructor/monitor of the student's progress. Lessons are graded by the machines and, in the event a particular student is not performing well, the trainer alerts the instructor/monitor that a student needs further individual attention. Initially, the trainers will be used to conduct deployment training for TACFIRE. After deployment, the trainers will be used with the MOS 13C Basic Technical Course at Fort Sill for skill level 3 soldiers, and the Advanced Noncommissioned Officer Course for 13C and 13E skill level 4 NCOs. (Mr. Cathcart, DCD)



Artillery control consoles.

View From The Blockhouse

New intercom TEC lesson

Soon to be available is a TEC lesson on how to set up and operate an intercommunication (intercom) system for the M109 and M109A1 howitzers.

This TEC lesson is a word/picture printed package that covers the following elements:

- How to set up and power-up the intercom.
- How to set up the intercom system's controls for intercom operation.
- How to attach the combat vehicle crewman (CVC) helmet to a given control box and how to operate the CVC helmet in combination with the control box.
- How to verify the operation of the intercom system operation.
- How to set up a field telephone for intercom interface.
- How to operate the intercom in combination with a field telephone.

Although this TEC lesson will initially be "forced issue" around 30 August 1979, additional copies can be obtained from USAFAS. Send requests to:

Directorate of Course Development and Training
ATTN: ATSF-CT-TD

Reference: TEC #936-061-0150-A (Operation of Intercommunication System of Self-Propelled Howitzer M109 and M109A1)

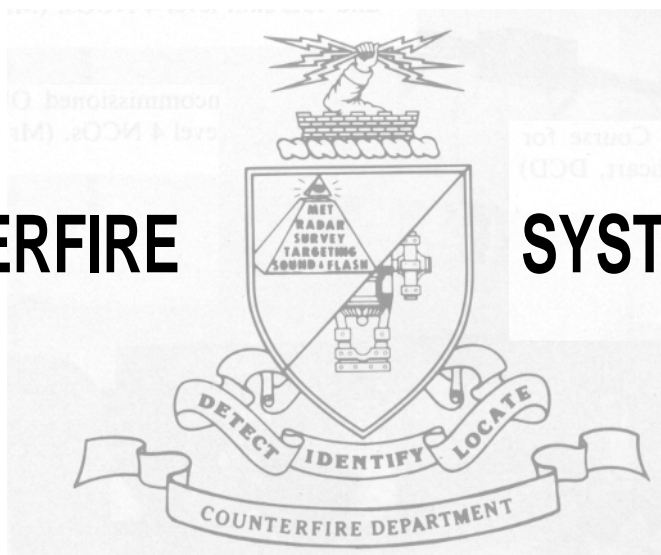
USAFAS
Fort Sill, OK 73503

(Mr. Bowman, CED)

Correction

The proper stock number for the range deflection fan protractor (RDP), scale 1:25,000, maximum range 30,000 meters, for 155-mm/8-inch units is NSN 1290-01-071-0726.

COUNTERFIRE



SYSTEMS REVIEW

Target Card (DA Form 4695) is here!

The Target Card (DA Form 4695) has finally been produced and is in stock at St. Louis. These forms are ordered through normal AG forms channels, and the unit of issue is a pad. There are 50 Target Card 2-page sets to each pad.

Recommended stockage levels are 200 pads (10,000 Target Card sets) per div arty and FA brigade.

View From The Blockhouse

Publication of FM 6-16-2 is programmed for FY80 and FM 6-16-3 for FY81. When the manuals are published, DA Circular 310-series and DA Pamphlet 310-3 will announce the destruction of the 12 May 1961 edition.

More map reading for lieutenants

As announced in the July-August issue of the *Journal*, the Counterfire Department recently began teaching a new 30-period course of instruction in map reading. Whereas the former 19-period course was aimed primarily toward target location, this new course involves the student in terrain association, navigation during motor movement, and cross-country land navigation. The course is experimental and was originally scheduled only for OBC classes 8-79 and 9-79. However, the 30-period course has been extended for the remaining classes in FY79.

The aim of the new course is to improve a lieutenant's ability to adjust artillery fire by giving him an appreciation of terrain association and terrain analysis. Additionally, the new instruction should improve a lieutenant's ability to locate himself and other elements. Currently, the Counterfire Department, the Gunnery Department, and the Directorate of Course Development and Training are conducting studies to determine whether the new course will help students adjust fire.

Initial results of the extended instruction will be available late this year.

Do not destroy old FM 6-16

Artillerymen should disregard the supersession lines on the new FM 6-16, Tables For Artillery Met (Electronic) Ballistic Type 3 and Computer Messages, and FM 6-16-1, Tables For Artillery Meteorology (Sound Ranging) Messages, both dated 10 May 1979. The old FM 6-16, Tables For Artillery Meteorology, dated 12 May 1961 is **not** to be destroyed until the complete FM 6-16 series (FM 6-16, 6-16-1, 6-16-2, and 6-16-3) are on hand as per paragraph B-4, Annex B, Field Artillery Meteorology.

The complete series of FM 6-16 manuals consist of:

- FM 6-16, Tables For Artillery Meteorology (Electronic) Ballistic Type 3 and Computer Messages.
- FM 6-16-1, Tables For Artillery Meteorology (Sound Ranging) Messages.
- FM 6-16-2, Tables For Artillery Meteorology (Visual) Ballistic Type 3 and Computer Messages. (This manual will contain alphabetical climatological regional supplements pertaining to particular regions divided by altitudes and seasons. Eventually, these supplements will replace departure tables.)
- FM 6-16-3, Tables For Artillery Meteorology (Type 2, Electronic or Visual) Ballistic and Computer Surface to Air Messages (for NATO cannon type ADA weaponry)

Firefinder training devices

To greatly improve training of the field artillery radar crewman/organizational mechanic (13R), the Field Artillery School will soon be receiving AN/TPQ-36/37 trainers. The Operator Trainer and Organizational Maintenance Repair Trainer will provide individual training and integration of basic and advanced skills essential for operation, maintenance, and repair of the AN/TPQ-36/37 systems. Additionally the trainers will provide means for enlisted personnel to practice and attain proficiency in prescribed individual skills, since almost 80 percent of the practical exercises will be conducted on the trainers.

The first Operator Trainer will be operational in January 1980 while the initial Maintenance Trainer is programmed for use in May 1980.

The Field Unit Trainer to be fielded with each Firefinder radar is a simple inexpensive unit, designed to generate targets and simulate rounds so that crewmen can maximize their proficiency without the expense of firing service ammunition.

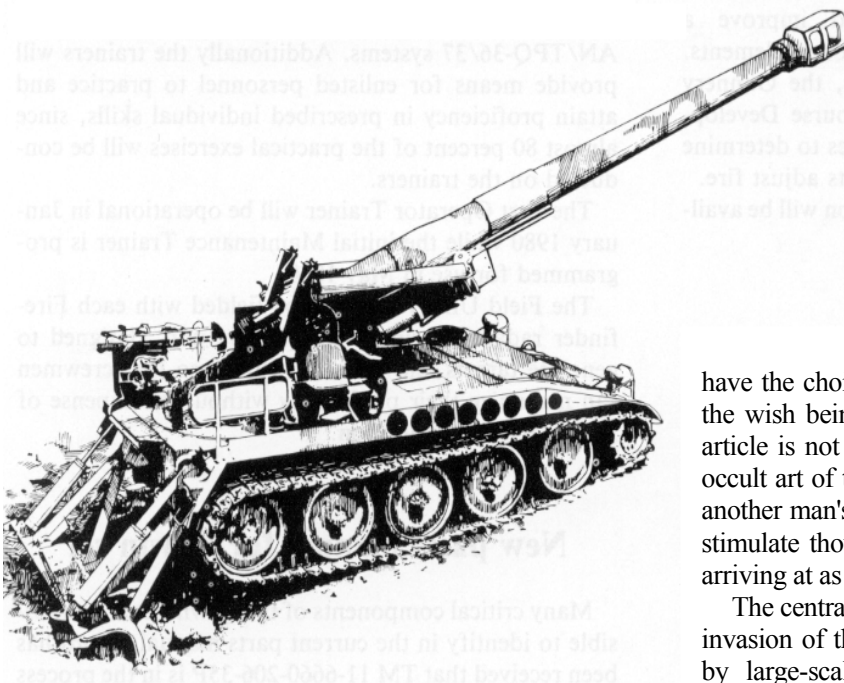
New parts manual for Rawin set

Many critical components of the Rawin set are impossible to identify in the current parts manual. Word has been received that TM 11-6660-206-35P is in the process of being completely revised and should be finished later this year. The revised manual will help the support maintenance shops procure those items that are required to keep the sets operational until the Field Artillery Meteorological Acquisition System comes aboard. Until the new manual reaches the field, a mimeographed list, prepared by the Meteorological Division of Counterfire Department, should be of help in identifying those parts which are the most common cause of failure. All met sections should have received a copy, plus a wiring diagram to convert the "E" model control recorder so that it works properly. Since sending this out, we have heard that our fix doesn't work on some of them, so if you have information to this effect, please let us know. Also, if you've found a better way to do something, please let us hear from you so that we can pass the word along.

Theatre Nuclear Weapons: Begging the Soviet Union to Pre-empt

by Jeffrey Record

Reprinted with permission from *Survival*, publication of the International Institute for Strategic Studies.



(Art by Lee Gibson)

One of the major unwritten assumptions behind NATO's strategy of so-called flexible response and forward defence is that the Alliance would be likely to enjoy the option of first use of tactical nuclear weapons in the event of Soviet aggression in Europe, and that resort to nuclear weapons under such circumstances would redound to NATO's benefit.

I do not know of a single wargame or exercise conducted in the West during the last decade which demonstrated that NATO reliance on tactical nuclear weapons to avoid conventional defeat conferred any lasting military advantages on the Alliance. If anything it simply hastened the progress of invading Soviet forces by provoking a massive and disproportionate Soviet nuclear response. As for the proposition that NATO would

have the choice of first use, this is simply another case of the wish being father to the thought. The purpose of this article is not necessarily to present the Truth — for in the occult art of theatre nuclear deterrence one man's axiom is another man's absurdity. Instead the article seeks simply to stimulate thought, and in so doing to assist in the task of arriving at as close an approximation of truth as possible.

The central proposition here is that a major Warsaw Pact invasion of the central region *probably* would be initiated by large-scale, pre-emptive theatre nuclear strikes. To believe otherwise is to hope that the Soviet Union would be gracious enough to neglect NATO's deficiencies while impaling herself on NATO's strengths. NATO's theatre nuclear and conventional force postures, in other words, invite pre-emption. Indeed, to the untutored observer it would appear as if the Alliance has set out deliberately to tailor and deploy its forces so as to provide every conceivable incentive for the Soviet Union to strike first with nuclear weapons. Ground combat forces are dependent upon comparatively few but temptingly large *autobahns* and rail facilities for movement to their assigned wartime positions; tactical air forces are concentrated upon a limited number of airfields; critical headquarters and command, control and communications centres remain unhardened; trans-Atlantic reinforcement, upon which the Alliance is so dependent, must be funnelled through a

handful of large, easily interdictable ports; and in-theatre arms and ammunition reserves, small as they are, are stock-piled at a few enormous sites, most of them virtually unprotected even from conventional air attack (this is particularly true of US war reserve and POMCUS [prepositioned overseas material configured to unit sets] stocks of ordnance and equipment).

NATO's theatre nuclear force posture provides the Warsaw Pact with a no less mouth-watering invitation to pre-empt. The bulk of the Alliance's 7,000 or so tactical nuclear warheads is stored at fewer than 50 readily identifiable sites. Moreover, most delivery systems capable of carrying a theatre nuclear war into the deepest recesses of Eastern Europe are themselves either immobile or tied to large, stationary installations such as airfields. No more tempting array of high-value targets has been offered a potential adversary since the Navy lined up the Pacific Fleet for slaughter at Pearl Harbor in 1941.

Soviet military planning

These invitations to a nuclear surprise might be tolerable if there were convincing evidence that the Soviet Union shared NATO's psycho-political dread of theatre nuclear war, or if the Soviet Union were effectively deterred from nuclear pre-emption by NATO's own theatre nuclear forces. Unfortunately the Soviet Union continues to manifest an irritating and alarming predisposition to treat theatre nuclear weapons as attractive instruments of actual war rather than as symbolic instruments with which to communicate political resolve in contrived and self-serving scenarios.

It has always been comforting to assume that the Soviet Union attaches the same significance as the West to collateral damage and to crossing the nuclear 'threshold'. How advantageous it is for the West to suppose that the Soviet Union would be as committed to avoiding collateral damage as NATO claims to be. How nice it is to believe that in the next European war the Soviet Union would manifest great reluctance to destroy civilian populations than the West did in the last one. How convenient it is for the West to presume that the Soviet Union shares concepts about the implications of crossing the nuclear 'threshold' and recognizes the subtle gradations Western strategists divine in the intensity of combat at the theatre nuclear level. However, as Raymond Aron has observed, the truth of the matter is that 'the entire American theory [of graduated response] . . . attempts to reconstruct the manner in which a strategist would behave if, like his counterpart in economic theory, he were both intelligent and well-informed. But

how many real-life chiefs of state resemble this idealized portrait? How many of them are always able to abide by the dictates of reason, at least reason defined by the theoreticians?'

Whatever allegiance Soviet military planners may have towards theoreticians, it is an allegiance to Soviet and not American concepts. Soviet writers, at least in their open literature, reject theories of graduated response. They reject theories of theatre nuclear forces as a hedge against conventional failure. They reject theories that tactical nuclear weapons should be used only *in extremis* and then mainly for the purpose of demonstrating political resolve. For the Soviet Union, theatre nuclear forces are but one of several components of a massive combined arms offensive, the primary purpose of which is to wage war, not to deter it. Their employment would be determined according to the dictates of military advantage and not to some preconceived notion that meaningful discussion with the enemy could be maintained across the almost impenetrable fog of theatre nuclear war by simply 'dialing' the proper yields and altering target selections.

Because the military advantages of pre-emption supersede whatever minor political benefits might attend willing consent to NATO first-use, the Soviet Union has little incentive to abjure the former in favour of the latter. In fact, Soviet theatre warfare doctrine continues to emphasize theatre nuclear pre-emption as a means of carving out corridors for an armoured *blitzkrieg* and of liquidating means of enemy reinforcement. Admittedly, recent Soviet literature and wargames do *appear* to indicate acceptance of the possibility that a major conflict *might* be characterized by an initial conventional phase. However, the dominant doctrinal theme remains an in-depth, massive, surprise nuclear strike as a means of paralyzing NATO defence — the preamble to a rapid, slashing advance of Soviet armour and mechanized infantry forces across Western Europe.

Recent Soviet recognition of the threshold between theatre and strategic nuclear war should not be misinterpreted as reluctance to cross the threshold separating conventional and theatre nuclear conflict. Although the Soviet Union no longer asserts the indivisibility of a nuclear war in Europe and a strategic exchange with the United States, she continues to reject the notion that a major war in Europe could or should remain non-nuclear. And it may be this very assumption of inevitability that leads her to the not illogical conclusion that it would be more profitable to use theatre nuclear weapons first rather than leave that choice to NATO alone. After all, NATO has an announced strategy of first use in the event of conventional failure.

¹Prepositioned Overseas Material Configured to Unit Sets.

Risking escalation

There is little doubt that Soviet theatre nuclear preemption would heighten the risk of uncontrollable escalation; but then so would NATO first use. I find it hard to believe that the Soviet Union, which is much better prepared than we to 'ride out' a strategic nuclear exchange, would somehow be more reluctant to risk escalation than NATO is. We might also remind ourselves that the credibility of the American strategic deterrent in response to anything less than a direct attack on the United States has eroded sharply during the past decade. Finally, let us recognize that the great escalatory watershed in any future European crisis would be the initiation of hostilities itself and not whether those hostilities were characterized from the very outset by nuclear strikes. The potential consequences of nuclear preemption for the Soviet Union pale in comparison to those that would attend the actual decision to go to war.

Nor should the impressive build-up of Soviet general-purpose forces during the past decade be misconstrued as a new-found preference for non-nuclear combat. The Soviet Union understands, perhaps better than anyone else, that investment in mass is the best single hedge against the extra-ordinary attrition of general-purpose forces that may be anticipated on a nuclear battlefield. Thus long-standing Russian emphasis on quantitative superiority — once sought as compensation for technological inferiority — now provides the necessary insurance against forecast losses in the kind of war the Soviet Union believes would be inevitable.

The credibility of the NATO nuclear deterrent

All this would be of little concern if the West could be confident that the credibility of NATO's nuclear forces was sufficient to deter Soviet pre-emption. But one wonders whether NATO's theatre nuclear forces can deter theatre nuclear war, or provide a significant defence should deterrence fail. A large percentage of Alliance nuclear warheads are tied to short range delivery systems which in all likelihood confine their use of targets on or over NATO soil. This would be particularly true under the present strategy of flexible response and forward defence, which envisages not only NATO first use but also NATO first use delayed until conventional failure was imminent, in other words, until the Pact had driven NATO forces deep into West Germany.

The knowledge that the bulk of NATO's weapons would be restricted to strikes on the territory of the Alliance's principal continental member is hardly likely to put great fear into the Soviet Union. Nor is the Soviet Union likely to be unduly alarmed by the fact that most of the remaining portion of NATO's theatre nuclear deployment — those forces capable of projecting the war

into Eastern Europe — is the most vulnerable to pre-emption. One of the many ironies of the current theatre nuclear balance in Europe is the inverse correlation, west of the inter-German border, between vulnerability and deterrence. Those NATO weapons least vulnerable to pre-emption — nuclear artillery and mobile surface-to-surface missiles — have comparatively little deterrent value because they cannot hit the Warsaw Pact where it would probably hurt the most. Conversely, and with few exceptions, those nuclear delivery systems with sufficient range to play havoc with the Soviet and Warsaw Pact military infrastructure in Eastern Europe are either immobile, like the *Pershing* missile, or compelled to operate from vulnerable airfields, like the F-4 and F-111 aircraft. The Soviet Union has avoided this dilemma by marrying range with highly nimble platforms in her delivery systems.

But perhaps the most spectacular advertisement of the doubtful credibility of NATO's supposed capacity to deter Soviet pre-emption is the simple and obvious lack of even the most rudimentary preparation for combat on a nuclear battlefield shown by NATO's general-purpose forces. Despite a strategy which pays lip-service to escalation across the nuclear threshold, and despite unceasing official discussion within NATO about the importance of chemical-biological-radiological (CBR) protection, both US and Allied forces stand virtually naked before an adversary who intends and is prepared to use chemical, biological and radiological weapons. In the face of a deliberate and comprehensive effort by the Soviet Union to insulate her forces from the potential effects of nuclear radiation, NATO continues to develop and produce armoured fighting vehicles whose crews and occupants would be easy game in a lingering nuclear environment. Even the new American XM-1 main battle tank and the proposed new mechanized infantry combat vehicle lack any system of collective protection. Continued reliance upon fighting vehicles ill-equipped to operate in a CBR environment is nothing short of criminal.

In sum, NATO's theatre nuclear deterrent does not appear credible. Restoration of credibility demands the removal of the various temptations NATO has provided for pre-emption, and the development of a massive and unambiguous capacity to carry a theatre nuclear war into Eastern Europe and to survive combat on a nuclear battlefield.

Some have suggested that NATO should adopt a strategy which would confront the Warsaw Pact with the prospect of NATO using her own nuclear weapons pre-emptively to break up any imminent attack — before the first Soviet guardsman crossed the inter-German border. Of course for NATO to adopt a strategy of pre-emption would require junking the Alliance's

current strategy, which obligingly cedes to the Soviet Union all of the advantages associated with the initiation of hostilities. But to be realistic, restoration of deterrence must be achieved within the confines of flexible response and forward defence. At the very least, restoration demands enhanced survivability of NATO theatre nuclear forces, greater emphasis upon long-range delivery systems mounted on mobile platforms, and genuine CBR protection for general-purpose forces. Greater survivability could be achieved through increased reliance on submarine and other off-shore platforms and by dispersing nuclear artillery and surface-to-surface missile ordnance among a larger number of storage sites. It goes without saying that command and communications centres and other critical installations should be hardened, and that stocks of non-nuclear ammunition and equipment should be made more secure. The US Army, Europe, might consider an alternative to storing over half its theatre ammunition reserves at a single location.

Carrying the nuclear war into Eastern Europe clearly demands accelerated attention to long-range delivery systems which could reach deep into Eastern Europe. This may not be possible, however, without deemphasizing short-range systems such as artillery, given the stringent fiscal constraints on research and development and procurement within a US defence budget that will continue to accompany reliance on the All-Volunteer Force. If choices must be made, and I believe they will have to be made, the development of new theatre surface-to-surface missiles and other long-range systems should be favoured over costly improvements in nuclear artillery.

Investing more money in new nuclear 8-inch and 155mm howitzer shells may therefore be unwise at this time; the money probably could be much better spent.

Indeed, during the next decade greater investment in the development of improved conventional munitions could provide means of performing conventionally the functions now assigned to nuclear artillery. I trust that the name of the game, at least for NATO, is still raising the nuclear threshold, not lowering it. The inherent vulnerability of airfields to pre-emption suggests that aircraft should also be de-emphasized as a means of delivering nuclear ordnance. The search for alternatives should begin with heightened exploration of potential tactical applications of cruise missile technology and of remotely piloted vehicles. The possibility of expanded reliance on theatre use of submarine-launched ballistic missiles should not be ignored.

In the final analysis, however, the deterrent value of even an invulnerable theatre nuclear force capable of inflicting upon the Soviet Union unacceptable damage in Eastern Europe would be questionable, unless it were accompanied by general-purpose forces capable of surviving on a nuclear battlefield. If the Western armies are either too timid or too ill-informed to insist upon collective CBR protection for their armoured fighting vehicles, then politicians will have to take action in the national legislatures. On the threat of Soviet theatre nuclear pre-emption, we are begging the Soviet Union to do precisely what she says she will do. Unless the Alliance is prepared to restore credibility to its theatre nuclear deterrent, the only side that will be deterred from using theatre nuclear weapons will be our own. ☒

Jeffrey Record is legislative Assistant for Military Affairs to Senator Nunn in Washington, DC. The views expressed in this article should not be taken as representing those of Senator Nunn or of any member of the Senate Armed Services Committee.

Commanders Update

LTC Michael B. Allen
2d Battalion, 3d Field Artillery

LTC David P. Gleichenhaus
1st Battalion, 21st Field Artillery

LTC John R. Cavedo
1st Battalion, 29th Field Artillery

LTC Don L. Lair
2d Battalion, 31st Field Artillery

LTC William N. Bailey
2d Battalion, 37th Field Artillery

LTC Ronald E. Bilyeu
1st Battalion, 39th Field Artillery

LTC Philemon A. St Amant II
1st Battalion, 73d Field Artillery

LTC George T. Crosby
18th Battalion, 4th BCT Brigade

The Soviet Theater Nuclear Offensive and the European Battlefield

by CPT Scott R. McMichael



The major US Planning assumption is that a Soviet/Pact attack, however determined, will be nonnuclear and will be countered by nonnuclear means until a stalemate is "stabilized."

William R. Van Cleave

"The basic method of the offensive is the making of nuclear strikes against selected axes and the rapid advance of tank and motorized rifle units and formations deep into the defended area through the breaches which have been formed."

Colonel-General N. A. Lomov (USSR)

For the student of Soviet military affairs, statements like the second one above by Colonel-General N. A. Lomov are commonplace. Taking even a cursory look at reliable military literature from the USSR, one theme becomes dominant—when the balloon goes up in Europe, those guys intend to shoot tactical nuclear weapons and lots of them. Despite the overwhelming evidence available of Soviet intentions, the US has not incorporated actual Soviet theater nuclear strategy into our own European defense planning. In point of fact, there appears to be very little discussion of Soviet tactical nuclear weapons and employment doctrine. Our service schools teach conventional tactics almost exclusively.

Our field units train for conventional war except for giving occasional attention to downwind messages and other NBC (nuclear, biological, chemical) reports concerning nuclear strikes which somehow never seem to be targeted against them (miraculously, as the CPX or FTX unfolds, we always manage to find and destroy their FROG battalions before they can launch a weapon against us).

I believe that the US Army is fooling itself with such wishful thinking. Therefore, it is appropriate now to examine how the Soviet theater and tactical nuclear weapons fit into overall Soviet military doctrine, how they plan to employ the weapons tactically, what objectives will be targeted with the weapons, and whether or not the Soviet force structure and training program supports their doctrine.

Overview

There is a fundamental difference between the way the West and the Soviets think about nuclear weapons. Western writers tend to regard nuclear weapons as retaliatory devices or a means to demonstrate political will. In the USSR their use is viewed primarily for application in combat (depending on the political objectives of the conflict). The Soviets believe that a theater conflict could (and would) go nuclear at any time and they recognize that NATO's greatest counter to the Soviet/Pact forces are the 7,000+ tactical nuclear weapons (TNW) deployed throughout Europe. Consequently, while the

US has failed to develop a theater nuclear strategy, the Soviets have shown the liveliest possible interest in the concept of theater nuclear warfare. As a result it is now the Soviets who set the pace here, as they do in so many other respects. In thinking about the unthinkable, they have developed a true war-fighting doctrine which incorporates theater and tactical nuclear weapons.

"The overall Soviet view is that nuclear and conventional weapons do not present an either/or proposition, such as those advanced in the West, but rather it is a matter of 'both/and'"

James Schlesinger

It is recognized that conventional and nuclear operations are different, but not in opposition; in fact they are complementary. In practice, the two modes of operation are closely integrated. Soviet military experts assert that nuclear weapons are the most revolutionary in terms of their effects on methods of combat. The conditions which their use creates and their coordination with conventional weapons, require drastic alteration of modern concepts of strategy and tactics. They also believe that, in many respects, a nuclear environment greatly enhances the effective employment of conventional weapons. We can see how this is so by examining the Soviet plans for the theater offensive.

The Offensive

Soviet military leaders have traditionally declared that the offensive is the most effective form of combat. The appearance of nuclear weapons, more than ever, has established the offensive as the decisive operation in modern war. The Soviets believe that nuclear weapons manifest themselves most fruitfully in two areas—firepower and surprise.

Superiority of firepower is an essential factor for success in combat—"the principal condition for achieving victory." Nuclear weapons clearly are intended to provide the primary firepower for the Soviet Army:

"The strategic and tactical missile forces are the basis of the firepower of the land forces for defeating the enemy. . . ."

Colonel-General N. A. Lomov

"Although earlier the basic firepower of the ground forces was artillery, now the chief means of firepower has become the rocket units. . . ."

S. V. Malyanchikov

The massive firepower provided by the theater and tactical nuclear weapons will most likely be used initially in a surprise or pre-emptive attack.

"Surprise has been a most important principle of military art since olden times. The employment of nuclear weapons has considerably increased the role and importance of surprise."

V. Ye. Saukin

"Surprise is achieved . . . by the unexpected use of weapons, and particularly nuclear ones. . . ."

Colonel-General N. A. Lomov

Current NATO presumptions are that the Soviets would tip off an attack at least 30 days in advance because of the requirement to accumulate a preponderance of combat elements, adequate reserves, and logistical supplies, thus giving NATO plenty of time to react. However, the Soviets believe that a surprise nuclear attack will allow them to achieve success without resorting to mass mobilization. A no-notice nuclear strike, based on key planning, good intelligence, deception, and covert preparations, conducted with the troops on the ground at night, in bad weather, or on holidays would be sufficient to deal a telling blow and to seize the initiative. In this sense, massing nuclear strikes, not conventional forces and equipment, assumes prime importance.

"In contrast to previous wars when . . . superiority was created over the enemy in infantry, tanks, and artillery, under present-day conditions, superiority in forces and means is achieved primarily by making nuclear strikes at the main enemy groupings. . . ."

General-Lieutenant I. G. Zavyalov

Thus, the balance of forces could be altered quickly and sharply, insuring victory.

Furthermore, the duration of the effects of nuclear surprise are prolonged by rapid exploitation by conventional forces. "Forward detachments" will be committed very early after the strike, closing with NATO forces before they have a chance to reconstitute a defense. Armored columns, attacking from the march, will conduct deep penetrations on several axes through breaches in the defense created instantaneously by the

nuclear strikes. The depth and pace of military actions are necessarily increased. Nuclear strikes will fall on deep targets simultaneously with those on the forward edge of the battle area (FEBA). Airborne and airmobile elements, trained and equipped for nuclear war, will be committed in NATO's rear to exploit those strikes. Speed and mobility, important before the advent of nuclear weapons, is considered essential to the success of the offensive. Combat formations must concentrate for the attack then disperse quickly to avoid a counter-strike, exploit breaches before the enemy has time to react, avoid contaminated areas and/or minimize exposure to radiation, and find and destroy enemy nuclear delivery systems before they can be used. According to the Soviets, the nuclear battlefield will be characterized by fires, devastation, large contaminated areas, uneven advances, absence of frontlines, and heavy losses on both sides. The overall picture of the theater nuclear offensive is one of violent, surprise nuclear strikes in depth combined with an immediate high-speed air and ground exploitation under conditions of massive destruction and contamination.

Targeting

The primary target for the Soviet strikes will be NATO nuclear delivery systems. If these are not eliminated, Soviet planners see little chance of conducting a successful offensive:

"For achieving the operation-level goal, it is now important to defeat not only the land and aviation enemy groupings in the theater of military operations, but above all its nuclear groupings, as without their decisive destruction, one can sparsely count on the successful carrying out of the missions in the operation."

Colonel-General N. A. Lomov

Here again is another justification for a surprise attack. The Soviets would like to destroy our weapons systems while they are centrally located before they are deployed, camouflaged, and protected. Massed strikes on NATO combat formations and defensive positions are just as important. As the main line of defense is thus breached, the battlefield is isolated from the approach of reserves or withdrawal of the committed troops by strikes on maneuvering units, on routes, on command posts, and the like.

Simultaneously, airbases, C³ centers, support units, and deep reserves in the rear areas will be hit. Subsequent nuclear strikes may be used to reduce centers

or points of resistance which are too strong to be bypassed, to assist in pursuit and further isolation of the battlefield, and to assist in crossing water barriers.

The elucidation of this doctrine certainly makes uncomfortable reading for those of us who believe the Soviets may mean what they say. Proper assessment of Soviet theater nuclear doctrine is not complete, however, without an analysis of their force structure and training program. Having seen what they say they will do, we must now ask the question, "Do they have what they need to do it?"

Force structure

Unfortunately, the answer to the preceding question appears to be a strong affirmative. Since the 1950s, Soviet forces have been designed for the nuclear battlefield. There is a remarkable consistency between their doctrine and force structure available for implementation.

Although information is not easily obtained on Soviet theater nuclear forces (TNF), it is estimated there are 700 tactical nuclear missile launchers which could be deployed in Europe by the USSR. These are the FROG (free rocket over ground), Scud, and Scaleboard missiles (table 1). Use of these systems is "presumed" authorized by the Kremlin, and once authorization is received by frontline and army commanders they will more than likely employ them as they see fit. In addition, the larger caliber artillery weapons are probably nuclear capable—the 18-mm S-23 gun and the M-240 and M-160 heavy mortars. Tactical aircraft can also deliver nuclear ordnance via the MIG-21 Fishbed and MIG-23 Flogger. The number of tactical warheads in theater is unknown. Soviet weapons are commonly thought to be inferior to US weapons, but this may be another example of wishful thinking. With their impressive research and development program, the Soviets may have already developed and deployed more accurate, small-yield weapons for their artillery and missile units. Should the Soviets desire to use them, IRBMs, MRBMs, and the Backfire bomber could also be used in the theater offensive, ranging all of Western Europe.

Table 1. Soviet launchers

Launcher	Where deployed	Range (kilometers)	Yield
FROG-3	Rifle div Tank div	35	25 kiloton max
FROG-7	Rifle div Tank div	70	25 kiloton max
Scud B	Front/Army	80-280	50 kiloton max
Scaleboard	Front/Army	900	sub-megaton

The conventional forces of the Soviet ground forces have also been designed for the nuclear battlefield.

Tanks were identified early as ideal weapons for nuclear war. Statements by the Chief Marshal of the Armored Forces Rotmistrov are particularly revealing:

"As postwar exercises have shown, tanks are more suited than other types of military equipment to combat actions where nuclear weapons are used. In particular they are suited to enduring powerful dynamic loads. . . . its armor protects the crew against light radiation and thermal effects and decreases the effects of penetrating radiation, while the tank's actual mass gives it stability which protects it against the shock wave. As a result of this, the use of tanks under conditions of nuclear weapons makes it possible to wage combat action immediately after the nuclear explosion, on contaminated terrain. . . . Thus the conclusion can be drawn that the appearance of nuclear weapons not only failed to diminish, but on the contrary only strengthened the role of the tank in battle."

William R. Van Cleave

It is clear that the Soviets have emphasized tank development and the motorization of the rifle divisions not just for the blitzkrieg but because of their utility on the nuclear battlefield. The new infantry fighting vehicles are armored and furnished with overpressure air filters to keep out radioactive dust and NBC agents. Other vehicles are fitted with nuclear effects sensors and instructions on survivability. Finally, the speed and mobility of the Soviet combat formations, composed of tanks, IFV's, self-propelled artillery and anti-aircraft weapons, etc. enable them to survive and exploit nuclear strikes. In truth, nuclear warfare in the European theater sharply enhances the capabilities of these conventional weapons vis-a-vis NATO weapons.

Training

Training for the nuclear battlefield in the USSR and Pact nations appears to be continuous, although superficial contradictions may appear. As noted above, the Soviets profess their intention to exercise nuclear options early on. In their training, however, they emphasize a dual capability of combined nuclear and conventional operations. This is not contradictory as they recognize theater war may be characterized at different

times by either conventional or nuclear operations. Their goal is to be able to shift gears swiftly and smoothly between the two and to excel at whatever level the battle is joined. Large-scale maneuvers since 1965 reflect this desire. Although there is some evidence of growing interest in Soviet military circles in nonnuclear theater war, this interest should not be overemphasized, since greatest attention is still paid to nuclear war. The demand for psychological preparation of the troops, the knowledge that the battle will proceed at high tempos under devastating conditions, the need for strength to endure burden, deprivation, and heavy losses are all stressed in training.

Conclusion


Having described the Soviet theater nuclear offensive in somewhat apocalyptic terms, I feel a few caveats are in order.

Although the Soviets have a plan and the tools with which to implement that plan, their ground forces have not been tested in combat since World War II; so it is not altogether certain that even the best laid plans can be carried out.

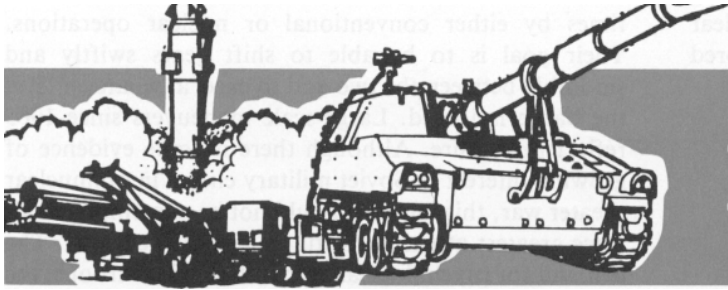
First, target acquisition may be their biggest weakness. The Soviets admit that, for their offensive to succeed, all or most of the NATO nuclear delivery systems must be destroyed. Considering the number of systems and the number of warheads, this is a tall order demanding intelligence of exceptional scope and accuracy.

Second, as it is described in Soviet military literature, the nuclear offensive requires great speed, exquisite timing, and detailed coordination. Heavy losses are expected and confusion and disorganization will be rampant. Individual initiative and expertise in making snap decisions will be at a premium at all echelons; therefore, it is not unreasonable to expect the centralized, inflexible, dogmatic Soviet system of command and control to break down.

Third, the concept of dual capability, simple in principle, may be difficult to achieve in practice because of the impossibility of devising one plan to fit both nuclear and conventional operations.

The final caveat is for US planners and commanders at all levels (i.e., all of us who dream up and who participate in European battlefield scenarios) to think about the unthinkable, and, having thought about it, prepare for nuclear war in Europe. We can no longer afford to ignore the overwhelming evidence that a future European battlefield will be nuclear. 

CPT Scott R. McMichael is assigned to HHB, 6th Battalion, 14th Field Artillery.



Right by Piece

Lance production canceled?

STERLING HEIGHTS, MI—Vought Corporation has announced plans to terminate manufacturing operations at the Michigan Army Missile Plant, ending production of the Army's Lance missile.

A Vought official said ". . . the lack of orders for additional Lance missiles forces us to close our production line in October 1980." The company announced last March that the phaseout would occur unless additional orders were received by mid-1979. Vought pursued sales to current users and some new foreign customers, but without success.

The Corporation will continue some services to support Lance in the field, including repair parts.

Lance proves airmobile

WHITE SANDS, NM—Soldiers of the Army's first Lance battalion recently became the first to fire a live missile airlifted to launch site.

The Lance missile, fired by B Battery, 1st Battalion, 12th Field Artillery, was airlifted as part of an airmobile operation during a tactical field exercise.

Last HJ unit inactivated

CAMP STANLEY, KOREA—On 16 June 1979 the last of the active Army's Honest John battalions was inactivated at Camp Stanley, Korea. The 1st Battalion, 31st Field Artillery (HJ), inactivation was separate from planned troop withdrawals which currently are being delayed. The battalion's rockets are being transferred to the Republic of Korea Army (ROKA).

101st gets Black Hawks

FORT CAMPBELL, KY—The 101st Airborne Division (Air Assault) is the first US Army combat-ready unit to receive the Army's new UH-60A Black Hawk helicopters.

Company D, 158th Aviation, the first company in the 101st to receive the new choppers, will use the first eight Black Hawks in an extensive force development test and experimentation phase. A total of 600 hours will be expended during the phase to conduct extensive troop movements and resupply and external lift missions.

The UH-60A Black Hawk is a US Army utility tactical transport helicopter, designed to carry a fully equipped 11-man infantry squad and a crew of three. Powered by two GET700 engines, the Black Hawk has a cruise speed of approximately 145 knots (167 miles) per hour and has a cargo hoop capacity of 8,000 pounds.

These helicopters can provide medical evacuation as well as troop supply and are suited for a wide variety of essential lift missions. The 101st is expecting a total of 90 aircraft by July 1980.



FA Museum director retires

FORT SILL, OK—Gillett Griswold, Fort Sill's official historian, authority on history of the field artillery, Indian expert, and director of the Post museum, recently retired after 25 years of outstanding service.

Mr. Griswold, who has a masters degree in anthropology, was instrumental in identifying and marking several hundred graves in Apache cemeteries on Post that previously had been allowed to deteriorate. This project required three years of research, mostly oral interviews with Apache family members brought to Fort Sill from New Mexico.

But, his first and continuing accomplishment was the expansion of the museum. Two display buildings housing artillery artifacts, McLain Hall and Hamilton Hall, were added in 1956 and 1957. The Old Stone Corral became a museum attraction in 1958. The outdoor cannon display was rearranged and enlarged into Cannon Walk which links Geronimo Guardhouse with the two cannon halls.

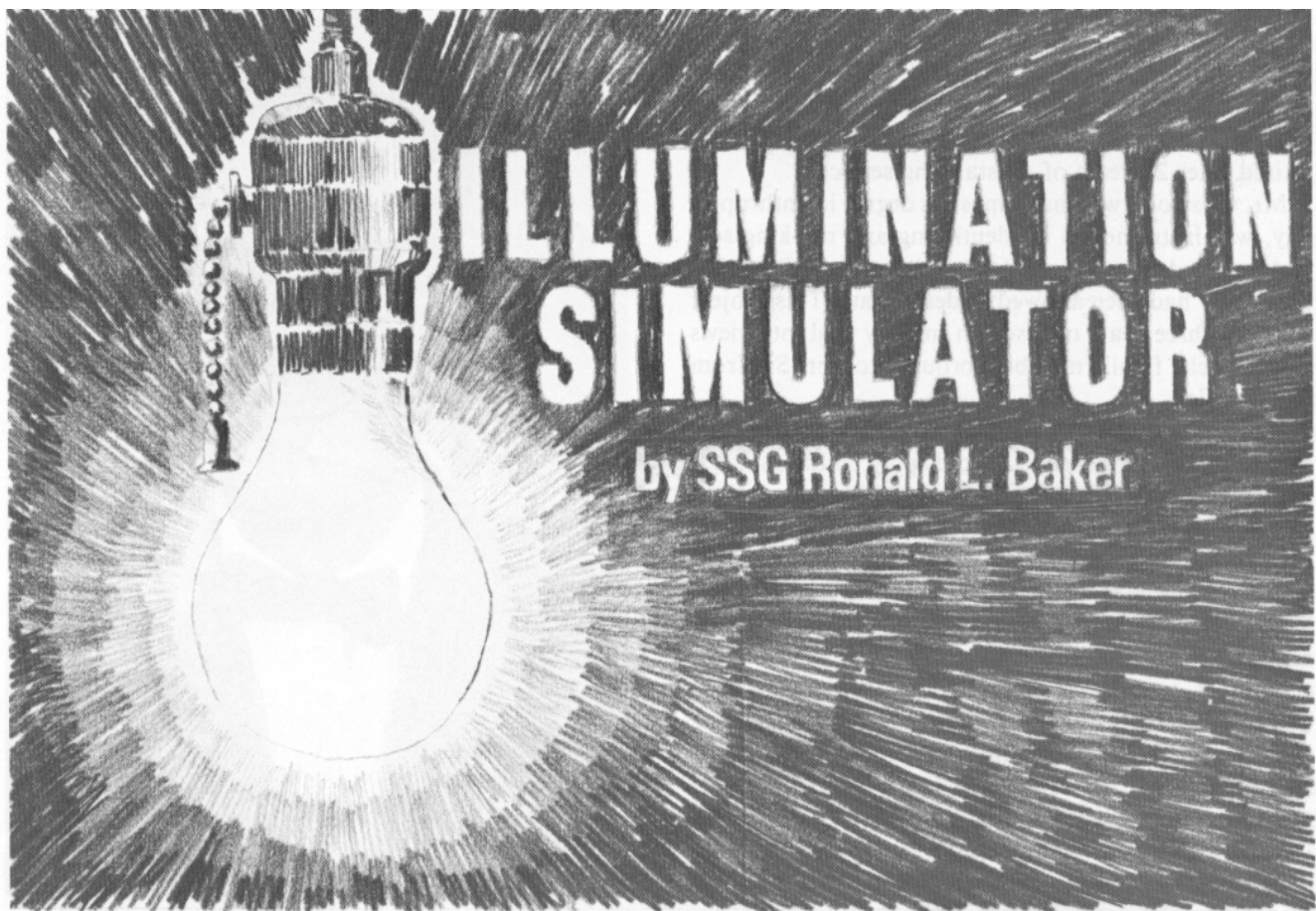
Another memorable contribution by Mr. Griswold was establishing the Field Artillery Half Section, a living exhibit which is an authentic replica of a horse-drawn artillery unit of the World War I era. Today, the half section is a permanent museum attraction, sponsored by Lawton merchants and the Southwest Oklahoma Chapter of the Association of the US Army.



Gillett Griswold



FORT HOOD, TX—Modern chariot races? It may not be ancient Roman style, but the 1st Battalion, 3d Field Artillery enjoyed the Army version during their Organization Day celebration. Bravo Battery—the winner—had the best "horses." (Photo by John Slezzer)



With incorporation of the fire support team (FIST) as a replacement for the forward observer section, new problems have evolved. To overcome these problems, individual units must take aggressive and innovative action to insure combat effectiveness on the modern battlefield. The FIST personnel of the 1st Battalion, 29th Field Artillery, have taken a step in this direction by developing a device to simulate 13F SQT task 1554—request and adjust continuous and coordinated illumination fires.

With a rising emphasis on budgeting and cost effectiveness, the amount of service ammunition will be limited, thus limiting training time in the field. Add to this the increased number of forward observers provided by the FIST concept and the unit has a real training problem.

In the observed fire portion of field artillery training, the observer must be able to see the results of his corrections to become truly proficient. Using existing training aids, such as the the M31 14.5-mm artillery subcaliber device, our observer sections can gain proficiency in most missions. The M31, however, has limited capability and cannot be used in the dark. Because of the limited supply of illumination rounds, it

is virtually impossible to allow every observer an opportunity to shoot sufficient illumination missions to maintain individual proficiency.

The current system of MOS evaluation—the Skill Qualification Test (SQT)—provides an excellent vehicle with which to sharpen the skills used in observed, indirect fire. By preparing for the SQT, FIST personnel acquire skills required in the ARTEP. The major drawback in this system, however, is the transition from the classroom to the field. To know the proper call for fire, target location, and adjustment techniques is great; but, without a practical exercise, personnel cannot be expected to maintain required proficiency. Again, M31 training is fine for daylight missions, but something was needed for night training. By providing our soldiers an innovative, realistic illumination training device, results achieved during recent field training exercises (FTX) were far superior to those conducted previously.

Setup of this training system takes about 10 minutes (figure 1). Minimum requirements are an aiming circle, a darkened room, a flashlight, and some matches. You must also have a *target* (initially we used a chalk eraser).


Tape the aiming circle to the floor and locate the target 10 to 15 meters away. Using the reticle pattern on the aiming circle, lay out 100-meter increments (use a fixed observer-target (OT) distance). At this point, corrections can be made and plotted accurately over the target area.

The student is given a direction and an OT distance and calls in the initial round by the polar method to a general, preplanned target area. Using the aiming circle instead of binoculars gives the impression of greater distance and also provides a lighted reticle pattern in the darkened room. A flashlight simulates the descending illumination round. The OT distance and shadows allow the student to use the mil relationship to adjust illumination over the target. With a minimum of practice, the FIST assistant instructor can make up and down corrections accurately with the flashlight. The 100-meter increments (determined by the set aiming circle) aid in corrections. Once illumination is correct, the observer calls for HE, again using a given distance and a direction off the aiming circle's upper motion. A second assistant instructor lights a match or lighter to simulate HE impact. The effect as seen through the aiming circle is very realistic.

One can add a variety of things to make the training even more effective. For example we use an AN/PRC-77 radio to call for fire and corrections. These commands are received by the fire direction center to

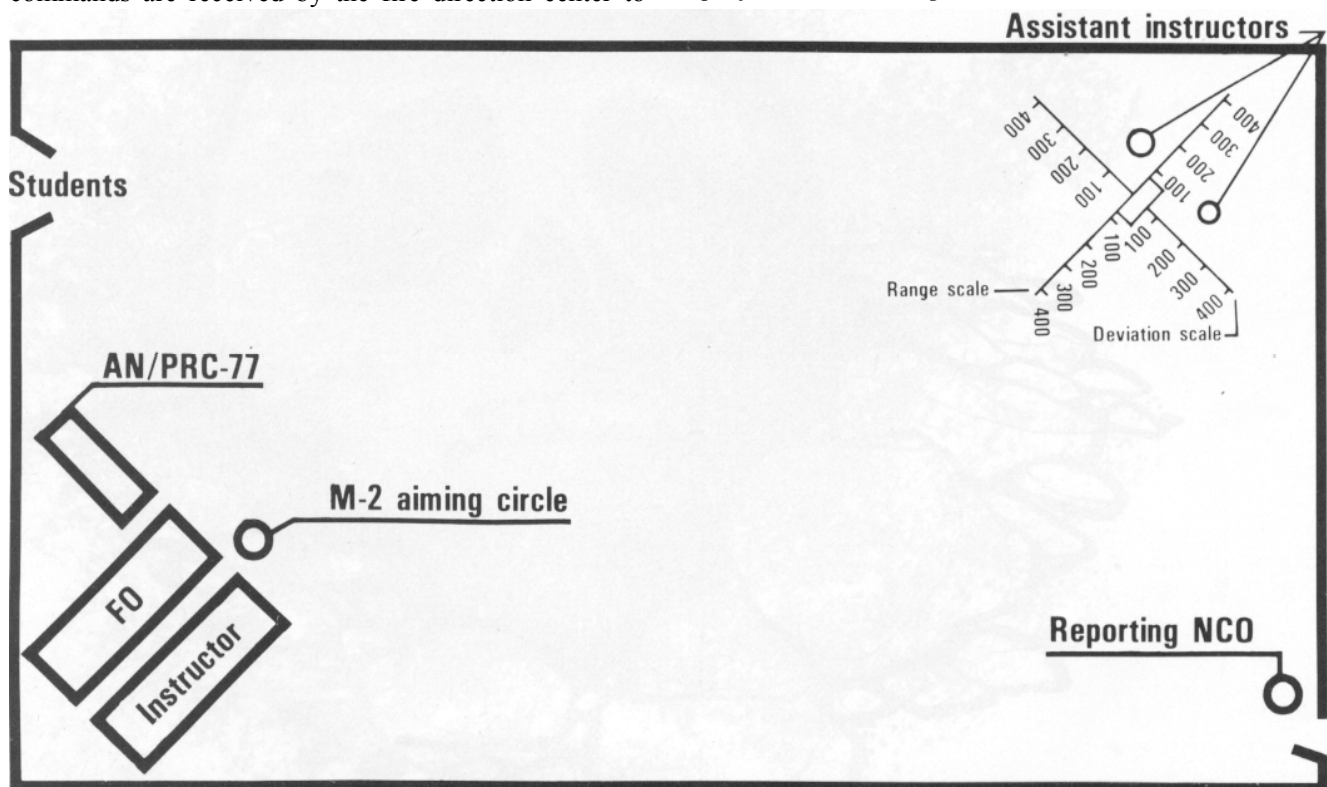
finalize the call for fire. We also use paper mache mock-ups, model vehicles, and miniature soldiers to make our target area look more realistic. This added realism motivates forward observers to concentrate on the job at hand.

The simulator, however, is only one part of the training exercise. Concurrent training on call for fire and adjustment techniques can be conducted in another room. By the time the forward observer is scheduled to take his practical exercise, he is qualified to perform the required duties.

With the growing cost and shrinking availability of service ammunition, we must make every round count. We feel that by the use of extensive classroom training, dry FTXs, the M31, and devices such as our illumination simulator, we can maintain a high level of readiness in our FIST sections and at the same time hold down the rising costs associated with observed, indirect fire. 

SSG Ronald L. Baker is a FIST chief in B Battery, 1st Battalion, 29th Field Artillery.

With decreasing training funds and resources, we all must look to new innovative approaches to maintaining skills required to do our job. Sergeant Baker's initiative and ingenuity are representative of this kind of professional thinking.—Ed.



Note: Range from FO to target is approximately 30 to 40 feet (approximately 5,000 meters). Always use the OT factor for the range you select. **Figure 1. Minimum requirements for the setup are an aiming circle, a darkened room, a flashlight, and some matches.**

The attack has halted. Threat forces are now consolidating and hastily preparing defenses for the expected counterattack. Their gains become more secure with each passing moment. Quickly the Allies prepare plans, issue orders, and redistribute logistics. Final preparations are complete, the attack is poised—yet from its outset it is doomed for failure! What has been overlooked? What has stripped from this attack the vitality needed for success? Part of the combined arms team is missing and with it the key to success. The missing ingredient—the direct support field artillery. It simply

failed to survive the first battle. This is a grim reminder of threat force emphasis on destruction of the field artillery and the extensive efforts it utilizes to accomplish this mission. Sadder, however, is the fact that this loss might have been prevented.

Absurd, not likely; pessimistic, perhaps. Hopefully these comments are accurate; yet my research leads me to believe that this potential disaster may not be as unlikely as we would like to believe. If we are to avoid this fate, field artillery survivability must again become an important issue.

A Dying Issue

by CPT Charles M. Williams



Certainly, efforts to improve survivability are acknowledged as important; yet it is my contention that very little real emphasis has been devoted to this subject. If any tactical doctrine has been developed, it is not taught at the School, nor is it disseminated or recorded for battalion and battery commanders in the field.

In the early 1970s while stationed as a lieutenant in Europe, I gave very little thought to the idea of survival beyond the defensive perimeter. The United States Army had ended its labors in Vietnam and the prevalent idea of artillery losses seemed to revolve around direct attacks on the battery positions. The idea of intense artillery barrages and counterfire from weaponry at least as sophisticated as our own did not seem to attract much attention.

The 1973 Yom Kippur War, however, signaled an awakening and revealed vivid insights about the totality of future warfare and its increasing threat to the field artillery. In his book, *The War of Atonement*, Major-General Herzog points to this destruction when speaking of the artillery ratios that occurred during the war:

"He had under command three batteries of artillery; facing him were seventy-five."

He also conceded an overall weakness in Artillery

". . . believing that airpower was the answer to the problem of the country's weakness of artillery."

After extensive research and analysis of the 1973 War, the United States set out to improve the tactical thinking and employment of the field artillery. As a result, the field was flooded with new material and innovations. These included such things as the offset registration, roving gun, "shoot and scoot," increased emphasis on terrain-gun position corrections (TGPC), position hardening, registration to the rear, and split battery operations. None of these were new to the Artillery Community. The gunnery procedures had existed for years. Volumes of literature on fire-base position hardening had been written as a result of Vietnam. So, while not new, what occurred was a renaissance in artillery tactics designed to reduce for our soldiers the frightening experiences of the Israeli artillerymen.

While at Fort Lewis, during this upheaval, my battalion was given many opportunities to experiment with the new techniques and apply them in a training environment. Perhaps, because we were members of the least mobile and, thus, the most vulnerable type of field

artillery unit, that of an infantry division, this training received heavy emphasis. From the commanding general down permeated the idea of keeping the artillery alive to fight another day. This was done without sacrifice of mission performance. Our primary interests were in the areas of mobility and position area operations.

Mobility is probably the biggest paradox in the whole survivability issue. The easiest way to survive, short of being out of the fight, is to move constantly. Tactics have always stressed the importance of mobility for both the offense and the defense. In fact, the position defense—long the standard—is giving way more and more to the active defense. The principle is simple—it's just more difficult to engage a moving target, whether with an M16 or an F-14. Yet the simple fact is that when moving during combat, unlike the armor and infantry, the artillery is not performing its primary mission. This task of hurling a 240-pound projectile up to 32 kilometers with acceptable accuracy requires too much precision to allow us the ability to perform well while moving. As a result, tradeoffs are necessary.

If too much movement is unacceptable, then the advocates of position hardening raise their cry. However, since most experts agree that engineer support will not be available for this chore, it becomes the task of the cannoneer to "dig in." Anyone who has ever tried to "bury" even an M102 howitzer in a treeline position, striking roots everytime the shovel hits earth, knows that this task leaves even the hardest of men too exhausted to function properly.

Nevertheless, while at Fort Lewis we tried increased mobility with roving guns, offset registration, split-battery operations, and spread-battery techniques. We also tried position hardening. In all cases the results produced a safe environment, but presented significant challenges to the overall system which had to be conquered. Our efforts resulted in varying degrees of success.

After receiving orders to attend the advanced course I felt that maybe I would find a more positive formulation of new tactics and future trends in survivability that would answer the many problems encountered in the field. Unfortunately, very little is said and seemingly little interest is paid to survivability. While most of the School departments acknowledge that survival is a key issue, really very little is taught to future battery commanders on the actions they might take to insure that their units are available to perform assigned missions. In fact, examination of course curriculum revealed that lieutenants rarely are exposed to the subject. Further study proved more revealing. From the wealth of study that revived its popularity, actually very little has been published on survivability for use in the field. Consider this statement in TC 6-100 dated February 1976.

"There have been many other changes developed in the way the artillery operates . . . which are spelled out in TC 6-20-1, 6-20-2, 6-50-1, and 6-50-1. All of these changes are sound tactical procedures which enhance the responsiveness and survivability of the field artillery in combat."

None of the above mentioned publications are current!

I also obtained a draft copy of TC 6-20-1 which will deal with battalion operations and tactics. It contains a paragraph entitled "survivability" and, while it provides some guidance on the subject, it is often vague or overly broad. Consider such items as:

- Analyze and use terrain and cover properly.
- Establish and maintain security.
- Defend in all directions.
- Provide mutual support.
- Maintain dispersion.
- Be flexible.
- Establish priorities.
- Establish control.


This almost seems good advice for any business executive in a large corporation. The problem is not with the advice but with the execution. So it goes—good advice but very little definitive instruction or information application by soldiers in the field.

Why then is the problem receiving so little emphasis? Three possible explanations come to mind. The first is that we simply do not regard the threat as real. The perception is that the enemy is not capable of rendering unacceptable numbers of our artillery combat ineffective. If this is true, then there is no need for the new tactics. Based on studies of the 1973 war and the known capabilities of our potential adversaries, this is not a likely conclusion.

If we assume that the threat exists, another intriguing possibility is the idea that we cannot accept the new tactics because of what I call the "American psyche." As a people we tend to cherish the "home run concept." We teach our children to throw the long pass. We heap praise upon the heavyweight slugger while politely acknowledging the counterpuncher. We glamorize the gunfighter standing toe to toe in the OK Corral blazing away. Yet even when badly outnumbered, we still seek to fight straight up—*toe to toe*—the ever-popular underdog. In the past our artillery was always big and strong enough to fight this way; however, I feel its dominance no longer is guaranteed. Nevertheless, perhaps, our tactics have fallen prey to this phenomenon.

My final hypothesis is that the subject may be too hard to manage—to set down in mathematical formats—and thus becomes unacceptable for publication. We possess the technical abilities to overcome the problems; yet there is that intangible ingredient that marks success for some units and failure for others. In short, what works for one may not work for another, and what is successful once does not insure repeated success. Therefore, because of its unpredictable nature we tend to be hesitant in formulating doctrine.

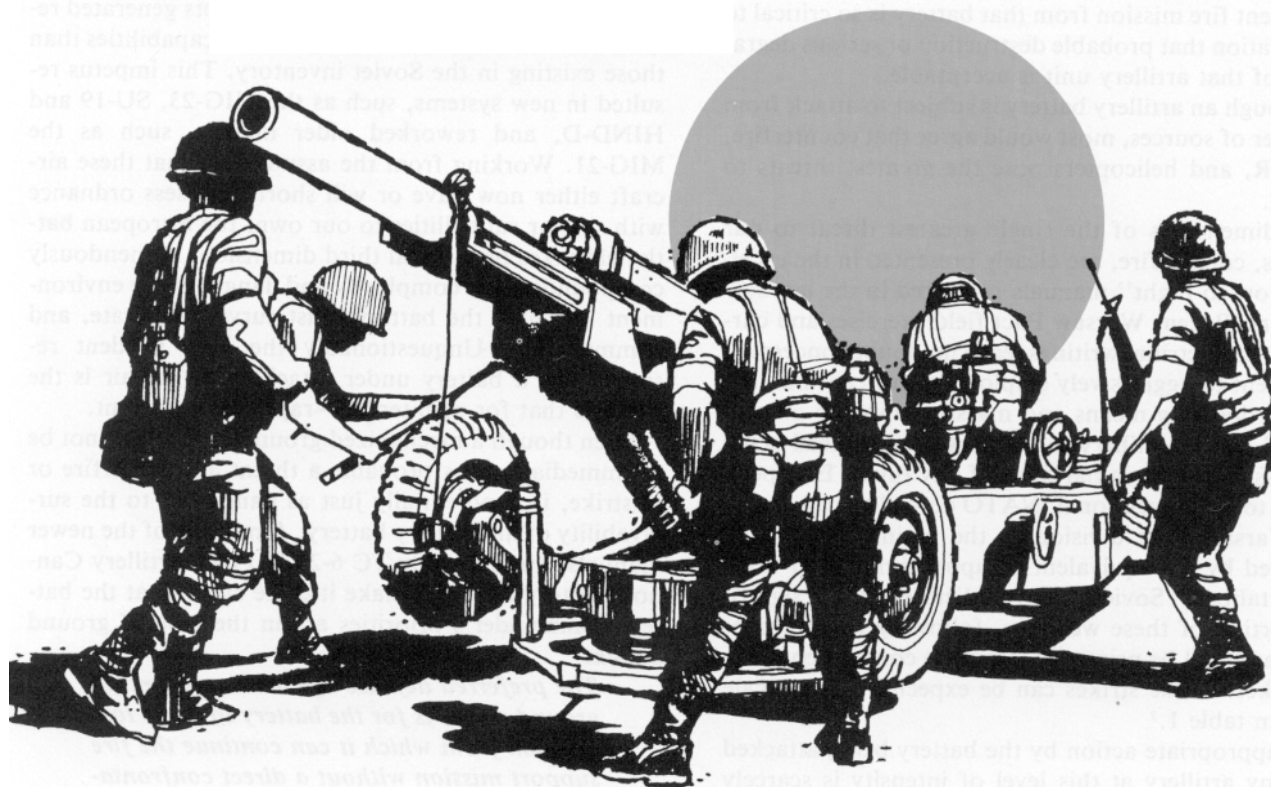
What, then, is the answer? One could conclude, that, for whatever reasons, survivability tactics for artillery batteries remain an ad hoc arrangement with very little formal doctrine. While recognized as necessary, the actual work in this area has pretty much been left to the individual efforts of battalion and battery commanders. I view this as a dangerous state of affairs that increases the likelihood of the scenario posed at the beginning of this paper.

First let me point out that I am not an advocate of rigid doctrines and approved solutions. The fact that we were left to our own devices at Fort Lewis enabled us to try new ideas and make significant progress. Tactics historically have been utilized best by those who took established principles and innovated to make the situation work for them. I propose that a document similar to FM 90-2 (Tactical Deception) be published for the artilleryman, giving guidelines and historical examples but not "right answers." Or, it might be more important to better use the experience and knowledge we possess. There are many smart field artillerymen with many good ideas, some field tested; yet their ideas remain secret. The ability to share these ideas must be better developed if we hope to overcome the situation. For example, computerized scenarios, such as the Legal Mix V Study, give data on survivability but the fact that it is classified retards its use in the field. I also received a copy of an interesting British study dealing on the same topic. However, as a rule, professional exchanges such as these are not shared among divisions, let alone foreign countries. We must become more proficient. Whatever the solution, the problem remains—SURVIVABILITY—a dying issue. 

CPT Charles M. Williams is attending graduate school at the University of Wisconsin.

Battery Perimeter Defense

The Last Resort



by MAJ Floyd V. Churchill Jr.

For many years US Artillerymen have noted with well deserved pride the classic examples of American Redlegs defending their guns in the face of overwhelming odds. Partially as a result of these past glories the Field Artillery today finds itself highly stylized in its approach to "defense of battery positions." I believe that the concept of battery defense, as practiced in most units, prepares them to defend in a manner appropriate to past wars but ignores the realities of the present-day European battlefield.

Appropriately, the "capstone" of the new family of Field Artillery manuals, FM 6-20, Fire Support in Combined Arms Operations, most clearly articulates the Field Artillery's prime mission on the European battlefield:

It is essential that fire support units survive on a mobility and firepower dominated battlefield. The combined arms team depends on it for success.

The emphasis of this statement is *not* on the restoration of a perimeter, or the holding of any particular piece of ground, but on maintenance of the unit as a coherent fighting entity. Battery defense, in its most basic form, is doing what needs to be done to insure that the unit *survives* as a functioning fire support element.

Clearly, then, staying intact as an operating, responsive mission-capable combat organization takes priority over almost all other demands.

However well fought, the next war will not be won as a result of the first battle. Field Artillery units therefore

must remain intact to fight the second and subsequent battles if we are to retain a reasonable possibility of success. This is not to say that FA batteries will not continue to fire when they come under attack; however, the option to defend in place must only be accepted when the responsible ground commander decides that the current fire mission from that battery is so critical to his operation that probable destruction or serious degradation of that artillery unit is acceptable.

Although an artillery battery is subject to attack from a number of sources, most would agree that counterfire, TACAIR, and helicopters pose the greatest threats to survival.

The dimensions of the single greatest threat to our batteries, counterfire, are clearly presented in the excellent "How to Fight" manuals produced in the last several years. Recent Warsaw Pact field exercises and current Soviet doctrinal writings leave no doubt concerning their intent to aggressively employ a significant number of target locating means and massive amounts of cannon and rocket artillery in support of their lead echelons. Assuming the initial stage of any future European conflict to be conventional, NATO defenders can expect each Warsaw Pact division in the main attack to be supported by the equivalent of approximately 17 artillery battalions.¹ Soviet doctrine dictates that a significant portion of these weapons, following the preparation phase, will be primarily tasked to conduct counter-fire strikes. These strikes can be expected on the scale shown in table 1.²

The appropriate action by the battery being attacked by enemy artillery at this level of intensity is scarcely open to debate. Rapid and immediate displacement is mandatory.

While counterfire has been and continues to be the firing battery's greatest threat to survival, the danger posed by Soviet airborne systems has increased ominously over the past several years. This dramatic shift is a reflection of significant changes taking place simultaneously in the areas of Soviet operational art and equipment use/design.

Until the mid-1970s, Soviet tactical airpower was oriented primarily toward either air defense or interdiction beyond their artillery range. Since that time considerable effort has been made to develop tactical concepts and operating procedures to integrate aircraft in a manner similar to that postulated by the NATO allies. The development of close air support concepts generated requirements for airframes with different capabilities than those existing in the Soviet inventory. This impetus resulted in new systems, such as the MIG-23, SU-19 and HIND-D, and reworked older models, such as the MIG-21. Working from the assumption that these aircraft either now have or will shortly possess ordnance with similar capabilities to our own, the European battlefield takes on a lethal third dimension, tremendously compounding the complexity and danger of the environment in which the battery must survive, operate, and communicate. Unquestionably the only prudent response for a battery under attack from the air is the same as that for counterfire—rapid displacement.

Even though a mechanized ground attack may not be as immediate or as probable a threat as counterfire or airstrike, it is potentially just as dangerous to the survivability of an artillery battery. A number of the newer manuals, most notably TC 6-20-9, Field Artillery Cannon Battery Defense, make it quite clear what the battery commander's priorities are in the case of ground attack:

The preferred defense against a mechanized ground attack is for the battery to move to a position from which it can continue the fire support mission without a direct confrontation with the enemy force.

Ground attack looms as the firing batteries greatest problem during the penetration and early exploitation phases of an enemy breakthrough. Such confrontations are likely to be chance or meeting engagements in which the Soviet elements will surely be better prepared and equipped. Once a battery is located, the responsible Soviet commander makes the decision to attack by use of counterfire, TACAIR, ground attack, or a combination.

Table 1. Projected expenditure rate stipulated for Soviet counterfire operations.								
Type target (battery)	Artillery (mm)					Mortars (mm)		Multiple rocket launcher (med)
	Guns		How		G-H	120	160	
	122	130	122	152				
SP armored guns	270	260	380	300	285	300	290	440
SP non-armored guns	240	230	310	260	240	250	240	380

¹International Defense Review, Vol II, No. 11/78, p. 1411.

²USACGSC RB 30-3, *Soviet Artillery Doctrine*, April 1978, p. 5-6.

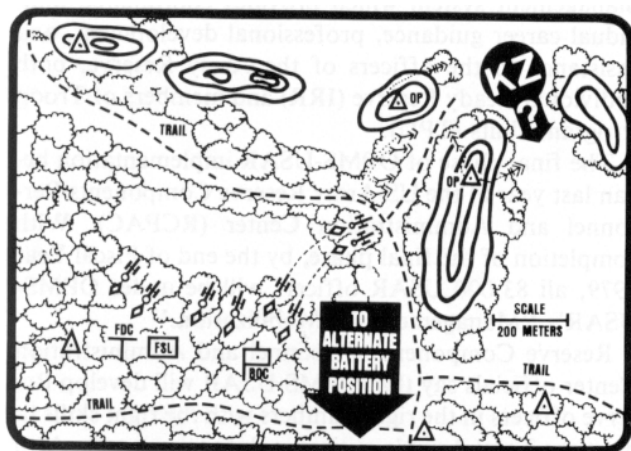
Reaction speed and optimal use of assets dictate that counterfire be used in most situations; however, should the commander opt for a ground attack, the minimum attack force dispatched will likely be a heavily reinforced tank or motorized rifle battalion, with the former preferred.³ While common sense clearly identifies the undesirable nature of such a confrontation, table 2 highlights the significant gap in our direct fire capabilities.⁴

Table 2. Direct fire confrontation weapons availability chart.

Weapon	Soviet motorized rifle battalion	US 155-mm battery (SP)
Howitzer		6
Tank	13	
IFV	30	
ATGM	154	
RR	2	
LAW/RPG	27	45
Mortar	6	
MG	116	22
Rifle	356	101

Again, survival of the artillery unit leads one to the inescapable conclusion that artillery batteries must train for and perfect rapid displacement procedures *prior* to physical contact.

Space limitations prevent an adequate discussion of various types of attack that Soviet doctrine allows on the European battlefield. No matter what form of attack the Soviets use (except possibly with partisans), the organic long-range communications of these attacking forces make it mandatory that the battery displace rapidly.



It *must* be assumed that an attack by Soviet elements other than artillery will be followed by intensive counterbattery fires in five to seven minutes. Any attacking force not strong enough to overrun the battery by itself will be attempting to fix the battery in place to allow the counterfire coordination process to be completed. Thus, defense of the battery position, in the traditional sense of restoring or holding a perimeter and continuing to operate from that location, is unrealistic because the unit will almost certainly be overrun or struck by devastating artillery strikes. In either case, incapacitating damage to battery personnel and equipment will result.

This is not to say that defensive perimeters should no longer be planned; but, the European battlefield commander should realize that the decision to man and execute a battery perimeter defense is an act of last resort, to be taken only when it is impossible to displace.

From my perspective the Soviet threat argues convincingly for immediate training in a high threat environment. Fundamental to this learning process is requiring artillery units to practice everything feasible to avoid detection, such as strict adherence to camouflage, noise, light, movement, and communications discipline. This in turn must be coupled with listening observation posts at extended distances from the battery, fully prepared alternate positions and routes, effective communications with deployed FIST and FSO teams, and well thought out and frequently practiced hasty displacement techniques. Finally, all elements must operate under the umbrella of an effective tactical SOP known and understood by all members of that unit.



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*The intent of this article is to cause the Field Artillery Community to evaluate the adequacy of our battery defense concepts and procedures and to provide pertinent information. The reader can then make his or her own analysis and conclusion as to whether a viable traditional battery defense is indeed, realistic. For other views on mobility versus survivability, see **Journal** articles "Survivable, Affordable, and Lonely" (November-December 1977) and "Gun and Run" (March-April 1978).—Ed.*

³DIA Report, DDI-1120-10-77, *Soviet Tank Battalion Tactics*, April 1978, p. 35.

⁴Data base for Soviet motorized rifle battalion is TC 30-4, *Motorized Rifle Regiment*, p. 4. For US 155-mm SP battery, base is MTOE 6-457H and FM 101-10-1.

REDLEG

NEWSLETTER

Rules change for First Sergeant Program

According to MILPERCEN, an MOS score of 100 or higher is no longer a requirement for the First Sergeant Program, since most eligible NCOs do not have a recent MOS score. The First Sergeant Program offers NCOs in balanced or overstrength noncombat arms MOSs an opportunity to serve as first sergeants in a combat arms unit. Participation in this program is voluntary and has positive impact on selection for attendance at the Sergeants Major Academy and promotion to E9. To be accepted, volunteers must:

- Be an E8 or an E7 on the E8 promotion list.
- Have no profile prohibiting duty with a combat arms unit. (This includes weight standards.)
- Be released by their branch.

Applications must be accompanied by a recommendation from the volunteer's command sergeant major or E9 rater and should be sent through channels to: USA MILPERCEN, ATTN: DAPC-EPK-A, 2461 Eisenhower Avenue, Alexandria, VA 22331.

Those selected are stabilized for 24 months at one of the following locations: Forts Campbell, Carson, Hood, Lewis, Ord, Polk, Riley, Sill, or Stewart. A choice of post option is available as long as vacancies exist. Upon completion of first sergeant duty, individuals return to their parent career branch for assignment in their PMOS.

Counseling offered for Vietnam vets

According to the Veterans Administration, an informal readjustment counseling program for Vietnam veterans will begin 1 October for those veterans who are experiencing difficulties with civilian life.

The program, authorized by the Veterans Health Care Amendments Act of 1979, will provide counseling to those veterans requesting assistance within two years after discharge or before 1 October 1981, whichever is later.

A variety of counseling services, supplemented by private psychological treatment, will be offered. If medically indicated, a veteran may be admitted to the VA's regular mental health program by request.

Some GIs due refunds

Soldiers stationed in West Germany from 1972 through 1977 could have some extra, unexpected money coming to them, as car insurance companies are paying a refund to soldiers with insurance in effect during that period.

The insurance refunds are to come from "technical excess funds," a government requirement that makes insurance companies repay money from excess profits.

Some insurance companies automatically applied the refund to policy renewal premiums; therefore, not all are eligible for the cash refunds. However anyone with car insurance in West Germany between 1972 and 1977 should make application.

Eligible soldiers requiring assistance in recovering monies can get help from the Noncommissioned Officers Association (NCOA). Further information and/or application forms can be obtained from the nearest NCOA Service Center or local chapter chairman.

Reserve OPMS

The Officer Personnel Management System—US Army Reserve (OPMS-USAR) is a centralized personnel management system which provides coordinated individual career guidance, professional development, and assistance to the officers of the Army Reserve, both Individual Ready Reserve (IRR) and members of Troop Program Units (TPU).

The final phase of OPMS-USAR implementation began last year at the US Army Reserve Components Personnel and Administration Center (RCPAC). With completion of the final phase, by the end of Fiscal Year 1979, all 83,000 USAR officers will be under OPMS-USAR's "Management for Mobilization."

Reserve Components Personnel and Administration Center officials say that OPMS-USAR will develop Reserve officers in the right numbers with the right skills to meet the Total Army's critical mobilization needs. Also the OPMS-USAR system will improve officer readiness by effective use of training dollars for mobilization related training.

Data at RCPAC shows that this management system has significantly increased retention rates.

Bonus for 15J Recruits

Recruits with no prior service who enlist for MOS 15J (Lance/Honest John Fire Direction Specialist) are now eligible for a \$1500 cash bonus.

To be eligible for the cash bonuses, an enlistee must:

- Be a high school graduate.
- Be in mental categories I-III.
- Have no prior service.
- Enlist for four or more years.

SQT results for MOS 15J to be used for promotion eligibility

As of 1 August this year, skill qualification test (SQT) scores are used in determining promotion eligibility for E5s and E4s with MOS 13J.

According to MILPERCEN, a passing score of 80 or a finish in the top half of test participants is required for 15J soldiers appearing before unit selection boards for the first time.

The SQT scores will not be used to change promotion standings of individuals who have been recommended for E6 or E5 advancement by unit boards until the next recomputation. Recomputations for E4s seeking E5 promotion will be in October; for E5s seeking promotion to E6, recomputation will be in November.

Soldiers recommended for promotion by unit boards must also have a 1000-point work sheet score which qualifies for promotion as announced monthly by MILPERCEN.

Individuals with MOS 15J can soon expect a copy of their last SQT results from the Army Enlisted Records and Evaluation Center, Fort Benjamin Harrison.

Awards for disaster service

National Guard members who were "direct participants" in the following disaster relief operations are eligible for the Humanitarian Service Medal:

- Guatemalan earthquake relief.
- Lion Assist (earthquake), Italy.
- Snow Go, New York State.
- Flood Appalachia, West Virginia, Virginia, and Kentucky.
- Johnstown, Pennsylvania flood.
- Flood relief, Washington State.
- Canary Islands relief (air disaster).
- Flood Texas, Southwest Texas.
- Bolivian air disaster.

MOS 13C reclassification

Effective 1 September 1979, MOS 13C (TACFIRE operations specialist) positions will replace MOS 13E at skill level 4 (E7) in accordance with Standard of Grade Authorization reflected in Change 12 to AR 611-201. In addition, a Special Qualification Identifier "T" (SQI "T") will be added to MOS 13C40 to identify TACFIRE training, since MOS 13E40 is to be eliminated from active force structure. Skill levels 1 through 3 (E1 through E6) 13E positions at battalion or higher level associated with TACFIRE computer operations will be reclassified to MOS 13C in accordance with the Standard of Grade Authorization (SGA) effective 1 September 1979 or upon effective date of receipt of TACFIRE equipment in unit, whichever occurs later.

Individuals who meet the reclassification guidance reflected in DA Circular 611-71 dated 15 April 1979, can request reclassification to MOS 13C (E1 through E6) by submitting DA Form 4187. Reclassification from MOS 13E40 to MOS 13C40 will be handled automatically by each post or MACOM AG section; however, in order for an E7 13C40 to be awarded an SQI "T," he must have completed the training shown in Change 12 to AR 611-201 and must submit a DA Form 4187 requesting it be awarded.

Incoming POVs must meet emission standards

Service members returning from overseas assignments who ship privately owned vehicles (POVs), to include motorcycles, must insure that each POV meets US emission control and safety standards.

According to the Military Traffic Management Command, individuals must be able to prove their POVs meet established standards; otherwise a bond must be posted with US Customs officials equal to the value of the vehicle.

Privately owned vehicles entering the US must be accompanied by a declaration statement on EPA Form 3520-1, "Importation of Motor Vehicles and Motor Vehicle Engines Subject to Federal Air Pollution Control Regulations," and HS Form 7, "Importation of Motor Vehicles and Equipment Subject to Federal Motor Vehicle Safety Standards."

For further information contact the following offices:

Director
Office of Standards Enforcement
National Highway Traffic Safety Administration
2100 2nd Street, S. W.
Washington, DC 20590

Public Information Center (PM-215)
U.S. Environmental Protection Agency
Washington, DC 20460



Super Surveyor Reborn

by MAJ Charles (Slim) Myers

What happened to the old "super surveyor" I used to have? Recently, many Field Artillerymen have asked that question because knowledgeable and experienced surveyors have become scarce. What has happened to the 82C MOS?

Training

In the early 1970s, Fort Sill had two resident survey training programs. The entry level Advance Individual Training (AIT) course of eight to nine weeks had heavy emphasis on logarithmic computations, covering tasks which are now contained in skill levels 1, 2, and 3. In AIT the student learned enough theory to take him to grade E6, but knew very little about actual instrument operation. A second course for section chiefs prepared the E6 to be a party chief and the E7 to be a section chief/chief of detail. These courses, combined with field experience, resulted in survey NCOs whose expertise was universally recognized.

Because of post-Vietnam reductions, resident NCO schooling was eliminated in combat support MOSs, to include instruction in survey. A much shorter, generalized course (ANCOES) for all target acquisition NCOs 82C, 17C, and 93F was substituted. The course was designed to prepare senior E6s or E7s for first sergeant duties, with limited MOS instruction other than an update of new equipment. There was no detailed technical training.

In 1975, TRADOC developed the concept of skill levels and all AIT courses underwent major revisions. Survey instruction concentrated on skill level 1 tasks such as measuring angles with the M2 aiming circle and T2 and T16 theodolites, measuring distances both electronically and manually, and recording data in a field notebook. Skill level 2 tasks, such as computing both manually (using logarithms) and electronically (using the calculator), and skill level 3 tasks such as survey planning were deleted. Our survey AIT graduate could now operate survey instruments, but lacked the background theory necessary to perform computations.

Reclassifications

As new survey equipment was added to the inventory, trade-offs in personnel were required. The hand-held calculator; DM-60; Survey Instrument, Azimuth Gyro, Lightweight (SIAGL); and, in 1980, the Position and Azimuth Determining Systems (PADS) all require that survey sections be reduced in strength to generate enough funds to buy the materiel. Unfortunately, most of the strength reductions came from skill levels 1 (E1 to E4) and 2 (E5). This created a major imbalance within the MOS as there were not enough skill level 1 surveyors to fill requirements for skill level 2, which in turn generated a shortage in skill level 3, which led to a shortage in skill level 4. As the problem evolved, MILPERCEN developed a solution called reclassification and plugged personnel from other fields into the 82C MOS. This solved the immediate problem of *strengths*, but the experience and, in some cases, the enthusiasm factors were lacking. Figure 1 reflects today's situation in a typical division.

<u>Skill Level</u>	<u>Grade</u>	<u>Authorized</u>
4	E7	6
3	E6	13
2	E5	28
1	E1/E4	35 = 11 who reenlist

Figure 1. One-third of first term skill level 1 soldiers will reenlist; therefore, only 11 are available to feed the 28 skill level 2 requirements.

When one considers that only 30 percent of the first term skill level 1 soldiers remain on active duty, the base of 35 drops to 11, feeding 28 slots in skill level 2.

The picture becomes even more grim when one analyzes 82C statistics worldwide. The 82C MOS is at 70 percent strength in NCOs, of which 52 percent are reclassified. Although many personnel who were reclassified are highly motivated, the valuable experience gained by years of working in a technical MOS in a field environment is missing.

Restructure

The future looks brighter because the US Army Field Artillery School (USAFAS) is making an effort to correct these problems. The requirement to develop a working solution came from several sources:

- The addition of PADS to the survey system will have a profound effect on survey strengths. The PADS team consists of two individuals: an E5 chief/operator and an E3 assistant operator. The PADS team will replace either a five or eight man traditional survey section depending on the unit (figure 2).

<u>Existing Structure</u>	<u>PADS Structure</u>
	<u>Typical direct support and general support battalion</u>
wo 5-man parties	One 5-man party One 2-man PADS teams
	<u>Typical div arty</u>
wo 8-man parties	One 8-man party Two 2-man PADS teams
	<u>Typical TAB</u>
wo 8-man parties	Two 8-man parties One 2-man PADS teams

Figure 2. A comparison between the present structure and PADS structure.

- With the fielding of PADS, AR 611-201, effective March 1980, will revise the job description for surveyors. This will lower some of the computation tasks from skill level 2 to skill level 1. Thus, the traditional survey party will go from two E5 computers to one E5 computer and one E4 computer/recorder.
- The USAFAS Directorate of Evaluation (DOE) completed an analysis of the survey AIT course and confirmed that the AIT graduates could measure angles

and distances and record data but that, due to the reclassifications, many units did not have experienced survey NCOs to train new personnel in computations.

- Field input in response to a USAFAS letter confirmed the lack of strength in the survey NCO ranks and highlighted the need for more computation and theory training in AIT. The USAFAS solution takes three major forms:


1) Coordination with MILPERCEN to insure a normal grade progression which eliminates the need for reclassification in the survey MOS. This will enable a surveyor coming up through the ranks to become an expert survey NCO through years of field experience. Figure 3 reflects what the grade structure will be in a typical division equipped with PADS.

<u>Skill Level</u>	<u>Grade</u>	<u>Authorized</u>
4	E7	6
3	E6	7
2	E5	16
1	E1/E4	45 = 15 who reenlist

Figure 3. The 45 skill level 1 soldiers supply the 15 who reenlist after their first term to fill the 16 skill level slots.

2) The addition of logarithmic computations to the survey AIT course as a result of the new job description in AR 611-201 will enable AIT students to understand the "theory" of why they measure angles, distances, etc. The new tasks will be listed in the 1980 Commander's and Soldier's Manuals.

3) The adoption of a "Section Chief's Course" at USAFAS is not fully approved but is being actively pursued by the School with TRADOC. It is envisioned as a "tracked" course for NCOs with common military subjects for three to four weeks and a technical track of four to five weeks in each soldier's MOS. There will be strong emphasis on "training the trainer" to insure that the graduate can return to his unit and conduct meaningful field section training.

The survey MOS problems have developed over a long period of time, and it will take several years to reverse the situation. As the MOS grows smaller through the introduction of new equipment, the Field Artillery must have professional surveyors to provide fast, accurate survey control. Artillerymen worldwide must all share in the goal to reestablish the "super surveyor" of years past. 

MAJ Charles (Slim) Myers is Chief of Survey Branch 2, Counterfire Department, USAFAS.

Rubber stamps make life more interesting

by MAJ Dave Mooney

I have always been fascinated with rubber stamps. Every time I stand in front of a desk with that little round rack of stamps, I can't help picking through them to see if there are any I've missed.

The first one that really made an impression on me was one that was essential to my education. Each semester in college, my schedule had to be stamped, "OK-BURSAR" which said I'd paid my tuition.

Over the years, the ingenuity of stamp proponents has increased. My friend the self-proclaimed bureaucrat has one that says, "Tentatively disapproved—resubmit in 30 days for final disapproval"

A former Sergeant Major of the Army had a great one for commenting on certain suggestions sent to him. It says, simply, "SUPER BAD."

And of course there are the ones in the novelty shops with various expletives that everyone deletes from the written word and so the stamps never get used; they just sit on the desk and look threatening.

I have only one stamp. I had it made when I first served on a staff and became underwhelmed with all the junk mail (or junk distribution) that floated into my box. The stamp reads, "Noted with interest, but not much."

It's a wonderful little device for returning useless pieces of paper to their originator—and it amazes me that in these days of a "paper crisis," nearly as serious (and apparently considered by many to be just as dubious) as the energy crisis, we still have so many useless pieces of paper.

Last week, I stamped six duplicates and three triplicates of messages, and one assumption of command order for one day's duration with 15 addresses, both on Xerox paper which has increased in cost from \$2 to \$2.45 per package since February. There was also an attendance roster of a meeting, telling me that I attended, along with three copies of a printed regulation having no relation to my office. Both of these were on printing paper, which has increased in cost from \$1.40 to \$2.10 per package since February.

The question continues to plague us. "Is there really a paper shortage?" Although many experts say yes, it seems that most greet the news with the comment, "Noted with interest but not much."

MAJ Dave Mooney, formerly assigned to the Field Artillery School, is now the Public Affairs Officer at Fort McPherson, GA.

Are Our Reserve Components Ready?

by CPT Gerald P. Nye

"Members of the National Guard and Reserve, instead of draftees, will be the initial and primary source for augmentation of the active forces in any future emergency requiring a rapid and substantial expansion of the active forces."

*Secretary of Defense Melvin Laird
August 1970*

With this statement the United States announced a significant change in its defense planning. The apathy toward the Reserve Components which had earmarked the Vietnam period was now passe. The Reserve Components were now to be equal partners and the term "Total Army" was born.

Direct spending on the Reserve forces increased dramatically over the next few years, and numerous programs were designed to improve Reserve training. The result, most experts agree, is an improved force structure. However, a growing public debate over the question of reinstating the draft has focused attention on Reserve readiness. Problems in Reserve strength were most dramatically brought to the public's attention when former Army Chief of Staff, GEN Bernard Rogers, clashed with Secretary of the Army Clifford Alexander on the need for a return to the draft, primarily to bolster Reserve units and the Individual Ready Reserve (IRR).

The four elements that constitute Reserve Readiness are personnel, equipment, training, and policy. This article will analyze the current status of each element, along with the present or forecasted programs to increase readiness in each area. The US Army, in addition to its Active Component divisions, has 12 USAR training divisions and eight ARNG combat divisions (five

infantry, two armored, and one mechanized). The ARNG also has 21 separate combat brigades and three armored cavalry regiments, while the USAR has only three separate combat brigades. Basically, the Army National Guard comprises the "teeth" of the Reserve Components with about 75 percent of its elements being combat units. Approximately 80 percent of the Army Reserve personnel spaces are combat support or combat service support. The relative importance of the Guard and Reserve to national defense is indicated by the fact that 55 percent of the Army's total deployable ground forces are contained in these two elements (52 percent of the infantry and armor and 58 percent of the artillery battalions are in the reserves). The only other significant difference between the National Guard and the Army Reserve is that the Guard is under state control until federalized, whereas the Reserve is strictly under federal control.

Strength

"We have studied the problem to death. We need immediate action to increase the number of reservists in units and to solve the IRR shortfall."

General Bernard W. Rogers

By the end of FY77, the total strength of the Reserve Components was over one million. Of that total, 363,800 were in the National Guard, 193,300 in the Army Reserve, and 471,304 in the Individual Ready Reserve. This constituted 90.9 percent of the 400,000 authorized strength of the Guard and 91 percent of the 212,400 authorized strength of the Reserve. These figures, with the exception of the IRR, have remained relatively constant, despite the fact that the Reserves have begun intensive recruiting. The National Guard, in 1976, had its second best recruiting year since 1945, yet ended up with a net deficit for that year of 26,260 because of personnel losses. This problem will most likely continue because of draft-motivated enlistees wanting out. The same circumstances apply to the Army Reserve.

Although these shortfalls are a hindrance to the Reserve's capability to perform its mission, they do not appear to be so debilitating as to negate Reserve readiness. Recruiting problems could worsen in the 1980s, however, and this is what causes the most concern. The number of young people of military age will decline sharply, from a peak this year of nearly 2.2 million 18-year-olds to 1.8 million by 1986.

A much more severe problem exists in the IRR. The IRR is a pool of former servicemen who would be called up quickly in the event of war to provide replacements for casualties in the first stages of a conflict. Only 182,000 now constitute the IRR out of a projected need of 729,000, a figure General Rogers termed "completely inadequate." To bolster the IRR, the former Chief of Staff called for a conscription of some 75,000 to 100,000 young men and women a year, keeping them on active service for several months, and then assigning them to the IRR for six years.

What incentives currently exist to entice young people into the National Guard and Reserve? The draft was obviously the biggest inducement, but, other than that, the extra income and retirement benefits appear most significant. Reserve Components currently list as their number one enemy the "Moot Memo," a restriction against paying new reservists before they actually report for their Initial Active Duty Training (IADT).

Note: The "Moot Memo" has recently been relaxed somewhat to permit payment to RC enlistees for the first six months of their enlistment. At the end of six months, they are placed in a nonpay status until departure for their IADT.

It may be several weeks, or more often, several months from the time an individual enlists until he is scheduled for IADT, and he may change his mind before he starts being paid. Also, many lose interest and more are discharged once they reach IADT because of poor mental attitude, loss of motivation, and similar deficiencies. The Reserves want to begin paying their recruits immediately and orient them to the Army before IADT, thus reducing the rate of attrition. Included also are proposals to increase retirement and educational benefits to keep intact fully paid military leave for those who are federal employees. (Some state, municipal, and private sector employers follow the federal lead). However, all these measures must be implemented by Congress, which shows a reluctance to appropriate the needed funds.

Equipment

"Critical shortages continue to exist . . . in standard medium tanks, self-propelled artillery, radar, tactical bridges, tactical radios, and other communications equipment."

***Secretary of Defense Rumsfeld
1975***

Concurrent with Secretary Laird's announcement was a commitment to upgrade the equipment of the Reserves. This commitment has yet to be fulfilled. Two decisions have had a major impact on the failure to attain this objective. The first was the decision to resupply the Israeli Army during the 1973 Yom Kippur War. To provide combat replacements as quickly as possible, tanks, artillery, APCs, and other equipment were removed from prepositioned stocks in Europe and from active units in the United States and flown to Israel. Only recently has this equipment been replaced from procurements originally designated for the Reserves. Then, in early 1978, the Carter administration made a commitment to "beef-up" American combat power in NATO, particularly in self-propelled artillery. Artillery battalions were to increase the number of howitzers in each battery, with this equipment to be drawn from the Reserves. Additional equipment would also be lost. This move was described as "a blow to the under-strengthened Guard and Reserve."

As of 1978, critical shortages still remained in self-propelled artillery, radar, tactical bridges, and tracked vehicles. The only significant program underway was the Army's increased production of M60 tanks and conversion of all reserve M48 tanks to the M48A5 configuration (diesel engines, 105-mm guns, and improved target acquisition and sighting capabilities).

Equipment shortages are said to seriously hinder Reserve readiness, especially when projected into the worst-case scenario—war in Europe with the Warsaw Pact. Of an equivalent 16 2/3 division strength within the Reserves, only 7 1/3, which are mechanized or armored, would be capable of operating in the highly mobile European environment. The remaining 9 1/3 would be severely restricted in their employment.

Training

"Recently, there has been much talk about establishing one standard for both Reserve and Active Component units. Persons who espouse this cause must remember that there would be no need for the Active Army if, in fact, the RC units could accomplish in one weekend a month and two weeks of annual training, what the active Army deals with 365 days of the year."

***LTC Harlan C. Herner
US Army Reserve***

Training, long the nemesis of the Reserves, is currently the brightest spot. In 1973, US Army Forces Command was established, with a mission of insuring the combat readiness of the Total Army within the continental United States. The 1st, 5th, and 6th US Armies give full attention to the readiness and training of Reserves. Actual assistance is provided by Readiness Regions and Groups, which contain Active Army personnel with the necessary expertise to assist Reserve units in their area.

In addition, affiliation and mutual support programs have been initiated. Affiliation consists of three elements: roundout, augmentation, and deployment capability improvement. Four divisions of the Regular Army (the 5th, 7th, 24th, and 25th) consist of two active brigades, with the third brigade for each being a Reserve Component unit. The RC brigade has modern equipment, trains with, and will deploy with their respective Active Army division. Other units within the Active Army have similar roundout reserve units. Under augmentation, specified Reserve Component units are added to fully structured active divisions to increase their combat power. For example, the 82d Airborne Division is augmented by two airborne battalions of the Texas National Guard. Under deployment capability improvement, 44 Reserve battalions will receive Active Army assistance in preparing for deployment. Mutual support is a program wherein Active and Reserve Components get together for training and assistance projects only.

The single greatest benefit of these programs is that Reserve units can train with Active units and absorb the expertise and assistance of the Regulars. Roundout and augmentation units have more of a sense of mission and identification with the Active Army.

Training has improved. In 1974, only one separate brigade had met readiness goals, but one year later, 50 percent of the ARNG divisions and separate brigades and 60 percent of the ARNG Armored Cavalry Regiments had achieved readiness. Although these figures are the latest available, the general feeling is that training is improving. The only pessimistic outlook is brought on by the forecasted future shortages of personnel and a need to spend more time recruiting at the expense of training.

Policy

The last area to be examined is policy. For the first time in history, the United States is planning to commit units immediately after mobilization, with no further training between call-up and introduction into combat. Historical evidence indicates that Reserve Components take almost as much time to "whip into shape" as do

entirely new units. It can be argued that Reserve Components never before have been organized and trained to go into immediate combat, as they are now. I did not research the degree of readiness of Reserve Components before 1970, but it does appear that if this is now the policy, then the government should take all necessary steps to insure that the Reserve Components are at the necessary state of readiness. A reluctance to commit funds for equipment, establish a draft for the reserves, and implement programs to insure retention of reservists are not indicators of strong support for this policy.

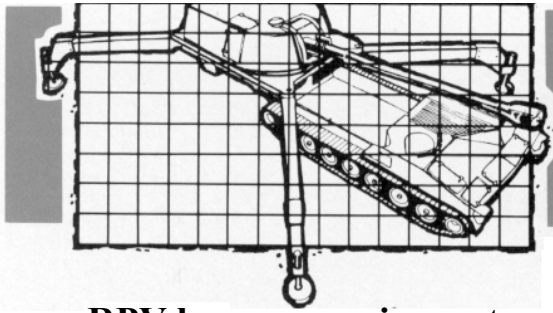
Are the Reserves ready? As I see it they are marginally prepared for immediate commitment. Training appears

to be in good shape. There are many Reserve units which are every bit as good as their Regular Army counterparts. Modern equipment must be provided to all the Reserves, not just the affiliated ones. The most critical area is personnel; as the manpower pool dwindles, it is critical to national security that this support be forthcoming. ✉

CPT Gerald P. Nye is assigned to Headquarters, 1st US Army, Fort George G. Meade, MD.



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FA Test and Development

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RPV becomes major system

Based on user and engineering design tests, the Army's Remotely Piloted Vehicle (RPV) has been converted to major system status. As a major system, RPV will receive greater attention at all Army agencies and command levels. The latest testing of the unmanned reconnaissance and target acquisition/designation aircraft has included air vehicle survivability and designation capabilities for precision guided munitions.

In March 1978, the RPV completed a survivability test against fires from an XM-42A anti-aircraft system and a .50 caliber machinegun. More than 3,000 rounds were fired, and the RPV was not hit. During the same test, the Redeye system was unable to engage the RPV because of the air vehicle's small infrared signature.

The ability of an unmanned air vehicle to provide laser target designation for precision guided munitions was successfully demonstrated on 3 June 1978 at White Sands Missile Range, NM, when an RPV/Copperhead team scored a direct hit on a stationary tank. The RPV's onboard gyro-stabilized sensor package provided accurate and stable laser designation of the tank while the air vehicle orbited at an average distance of 1,400 meters from the target.

On 13 October 1978, responsibility for the RPV system was changed from the Combined Arms Combat Development Activity to the Field Artillery School, based on tests and analysis which indicated that the greatest contribution of the RPV is in its field artillery functions of target acquisition/target engagement and laser designation.

A major milestone in RPV system acquisition occurred in August 1979 when the contract for full-scale engineering development was awarded.

Improved smoke projectile

Project managers of Smoke/Obscurants and Cannon Artillery Weapons Systems have announced successful completion of the advance development project for an improved 155-mm screening smoke projectile, designated the XM825.

The XM825 utilizes a submunition concept to spread felt wedges saturated with white phosphorus (WP) over the target area. Submunitions were selected to overcome operational and logistical problems that exist with

current inventory smoke rounds. Capable of providing a quick and effective screen for five minutes, the XM825 is a member of the M483 ballistic family and it will have a zone 8 charge range comparability. It will be fully interoperable with the US M198 and Trilateral Nations (UK-GER-IT) FH70 howitzers.

Type classification is planned for the fourth quarter of FY81. Initial fielding is projected for the second quarter of FY83. Meanwhile, the Army will rely on product improvement of the 155-mm M116 hexachloroethane (HC) round and the M110 WP round. (*Army R, D & A magazine*)

New RAP for 155

The rocket-assisted projectile (RAP) M549A1 for use in the M114A2, M198, and M109 155-mm howitzers will soon reach artillery units in the field.

The new RAP will provide the 155-mm howitzer with a significantly increased range capability as well as improved fragmentation qualities.

The M549A1 has two distinctive preassembled components: the high explosive warhead and the rocket motor. The warhead is made of a new high fragmentation steel, and the rocket motor is made from high strength steel alloy and employs a solid propellant.

A pyrotechnic delay assembly in the rocket nozzle provides ignition for the motor. Also, a new lifting plug has been fitted to protect the warhead nose in rough handling. (*Army R, D & A magazine*)

Ripple firing of GSRS

Vought Corporation has successfully ripple-fired 13 General Support Rocket System (GSRS) rockets from the self-propelled launcher loader.

During separate tests in June and July ripple firings of six, three, and two rockets were conducted.

These successful firings support predictions that the system can fire its entire 12-rocket salvo in less than one minute.

Each of the rockets measures four meters (13 feet) in length and 227 millimeters (nine inches) in diameter. During ripple fire operation they are quickly and automatically fired by the fire control system, which repositions and re-aims the launcher loader module after each shot.

Henry Knox—

The Father of American Artillery

by CPT Richard L. Heit



To say that he was "present at the creation" would be an understatement. The truth is that Henry Knox was present at almost all the important events taking place before, during, and after the creation of the United States of America. From an inconspicuous militiaman, he rose to become a major general in the Army. Not only was he a close friend of George Washington, but he was also his Chief of Artillery and one of his most trusted advisors during the Revolution.

Henry Knox was born 25 July 1750 in Boston, the seventh of 10 sons born to William and Mary Campbell Knox. When Henry was 12, he was forced to quit school and take a job in a bookstore to support his mother and youngest brother, William.

He later opened his own bookstore which became a gathering place for all the upper crust of Boston society. Among his friends and customers were John Adams, John Hancock, and Paul Revere.

At age 18, Henry joined an artillery company known as "The Train." An offshoot from this company, the Boston Grenadier Corps, was formed in 1771 and Henry became second in command.

Knox was six feet tall and weighed 280 pounds. An explosion of his fouling piece during a hunting excursion in 1773 left him without the last two fingers on his left hand. To conceal the injury, Knox thereafter skillfully wound a silk handkerchief around his hand.

In 1774, Knox married Lucy Flucker, daughter of the royal secretary of the Massachusetts province. Lucy's only brother was a lieutenant in the British Army and there were attempts to entice young Knox into accepting a commission with the King's forces.

Knox's book business was prospering quite well in 1775. Paul Revere and several other young Bostonians patrolled the streets at night to watch for and report any suspicious movements of British troops to the rebel patriots on the outskirts of Boston. Knox was a well-known

sympathizer with the rebel cause and was kept under surveillance and forbidden to leave the city.

Lexington, Concord, and Cambridge were then the centers of rebel activity. British troops were dispatched on 18 April 1775 to capture or destroy the military stores at Concord and Worcester. This was to be a secret mission but was spoiled by the warning of the countryside by the famous "midnight ride of Paul Revere."

On 19 April, Knox, unable to remain in Boston while his rebel friends were gathering forces outside the city, escaped with his wife to nearby Cambridge, the colonial headquarters. Knox's sword made the trip cunningly sewed inside the quilted lining of Mrs. Knox's cloak. Lucy, in following her patriot husband, was leaving her Loyalist family, never to see them again.

Henry reported immediately to the headquarters of Artemus Ward, the commander of rebel forces, and offered his services as a volunteer, asking no special commission. As he had done considerable reading on military art and engineering in his bookstore, Knox was utilized as a planner and builder of fortifications around Boston.

In Philadelphia, on 17 June 1775, the Continental Congress appointed George Washington to be the Commander in Chief of all the armies raised for the defense of liberty. Washington arrived in Cambridge on 3 July to assume command of the motley array of patriot militiamen and volunteers.

A rapport existed almost immediately between Knox and General Washington which was to last throughout the lifetimes of both. Knox's initiative, courage, and loyalty were proved many times and his advice was sought by Washington on all types of military plans and decisions. Knox was very strong in spite of his obesity, and was clever and possessed "a jubilant personality." Given the least to work with, Knox could always improvise a suitable solution.

Washington wrote to the governor of Connecticut in November 1775 to complain of the lack of trained engineer officers, stating: "Most of the works thrown up for the defense of our several encampments have been planned by a few of the principal officers of the Army, assisted by Mr. Knox, a gentleman of Worcester." Later the same month, Washington wrote to the President of the Continental Congress, as follows:

The council of officers are unanimously of opinion that the command of the artillery should no longer continue in Colonel Gridley; and, knowing no person better qualified to supply his place, or whose appointment will give more general satisfaction, I have taken the liberty of recommending Henry Knox to the consideration of Congress.

Richard Gridley, a veteran of the French and Indian War, was unfit for further service, due to age and infirmities. Below Gridley in rank was David Mason who agreed to serve as a lieutenant colonel if Knox were given a colonel's commission. Many other active artillery officers agreed with Mason that Henry Knox was a worthy leader for their most important arm of service.

As the siege of Boston continued, it became apparent that the patriots lacked guns of sufficient size to throw shot into the town. Benedict Arnold has been credited by some with thinking first of the cannon which he and Ethan Allen had "liberated" from the British at Fort Ticonderoga. It was Henry Knox, however, who is credited with informing Washington of the possibility and asking permission to undertake the mission of transporting the guns to Boston.

Knox planned to make the journey to Fort Ticonderoga during the winter while the streams were frozen and the roads would be passable by sled. Open water would be traversed by boat. Knox was accompanied on the journey by his brother, William, then about nineteen years of age. William had been left in charge of the bookstore in Boston but had escaped to the rebel camp after the shop had been looted by the British and Tory residents.

Washington sent word to General Philip Schuyler, in New York, to render all necessary assistance to the Knox expedition. Knox travelled to New York, there gathering supplies for the journey, and then went to Albany, where he met with General Schuyler. The many teams of oxen needed for the hauling of the cannon were procured at great difficulty throughout the sparsely-settled countryside.

The expedition arrived at Ticonderoga on 5 December and immediately collected the artillery pieces. Knox's inventory listed 8 brass mortars, 6 iron mortars, 2 howitzers, 13 brass cannon, 30 iron cannon, a barrel of flints, and some lead. The largest pieces were brass 18- and 24-pounders and iron 12- and 18-pounders.

Rather than the 16 or 17 days predicted by Knox, the long journey over hills, streams, and often nonexistent roads required another 40 days.

With the arrival of the Fort Ticonderoga guns in the rebel camp, the British occupation of Boston was almost over. The guns were quickly emplaced on Dorchester Heights and the British soon decided in favor of evacuation. General Howe departed Boston for Nova Scotia with 9,000 troops and 1,100 Loyalists. Among the Loyalists fleeing to Nova Scotia, and eventually making their way to England, was the Flucker family, Henry Knox's in-laws. A great rejoicing was heard from New England to Georgia over the news that the British had withdrawn.



Knox brings the guns from Fort Ticonderoga, 1775. (Oil painting, "Noble Train of Artillery," by Tom Lovell)

The scene of active operations then moved to New York and New Jersey since it was felt the British would return to strike at Long Island or New York Harbor. While the bulk of the forces were hurrying from Boston down to New York, Knox was ordered to proceed to Rhode Island and Connecticut to lay out fortifications for points along the coast that had been threatened by the enemy.

Knox, having arrived at New York, reported to Washington on 10 June 1776, that he had 121 cannons ready for action, requiring 1,200 men for their service. His regiment at the time consisted of 520 men. He recommended a draft be instituted to fill the ranks.

Throughout the remainder of the Revolution, Henry Knox was always close to the action. He stayed close to his guns and close to his Commander in Chief. He directed his artillery firsthand, many times actually servicing the pieces. He was an advisor to Washington in the fields of artillery, engineering, and ordnance.

After the evacuation of Fort Lee, Washington's little Army began its retreat across New Jersey. As the year 1776 was about to close and the enlistments of most of Washington's men were to expire, the Army was

perhaps at its lowest ebb of the war. Washington was disturbed by visions of a possible defeat at the hands of the British soldiers. Meanwhile, the rotund Henry Knox, in his letters and conversations, displayed the same unwavering belief in the ultimate triumph of the patriot cause. Knox felt that the cause was too dear and too honorable for the God of Nations to allow a failure. Knox's cheerful spirit and lively optimism helped to bolster General Washington's enthusiasm.

A bold and daring plan was devised by Washington to heighten the patriot spirit and badly cripple the enemy. His plan was to cross the Delaware on Christmas night and attack the sleepy, drunken (hopefully) Hessian garrison at Trenton the next morning before they could awake from holiday overindulgence. Henry Knox was placed in charge of the crossing; his voice could be heard above the howling wind, the crashing waves, and the thud of floating ice blocks colliding with one another. Knox superintended the passage of about 3,000 men, 18 field pieces, and several horses during that long, cold night.

Contrary to the picture by a German painter (who had never seen the Delaware River) of Washington crossing the Delaware standing in the bow of a small boat clutching an American flag (which had not yet been designed), Washington made the crossing in the same boat with Henry Knox. The "small boat" was actually one of the several large Durham boats used for the crossing. The boats were 40 feet long, 8 feet wide, and drew only 20 inches of water when fully loaded. They were pointed on each end and could travel in either direction. They carried masts for two sails, but they could also be powered by hand. A crew of four to each boat used two setting poles per side. The men thrust the poles into the river bottom and walked the length of the boat on a running board built along each side, thus pushing the boat forward one full boat length. These boats could carry as much as 15 tons, making them ideal for artillery, horses, and men.

During the crossing, Washington noticed that his fat, young chief of artillery, being almost as wide as the boat, was inclining it to one side. Washington peered at him through the driving snow and shouted:

"Shift your ass, Knox, and trim the boat!"

A muffled roar of laughter was heard from the men on board. It was the only laughter of the entire dark journey.

When the crossing was completed, at approximately 0200 hours, the patriots were still nine miles from the objective. The march through the icy, bleak storm into Trenton was completed at great difficulty and they arrived just as dawn was breaking. The town of Trenton proved to be an artilleryman's dream, the main streets

converging upon each other in the center of town making an ideal battery location. Since most of the flintlocks had become dampened during the march, the battle was chiefly one of artillery, bayonet, sword, and spontoon. Knox's artillery fired down the length of each street dealing destruction with each firing.

On 27 December 1776, the day after the Trenton victory, Henry Knox was appointed Brigadier General.

The Trenton Battle was followed quickly by the Battle of Princeton after which the Army repaired to winter quarters at Morristown. While at Morristown, Knox formed a training "academy" to better train his cannoners. He had expressed his opinion in a letter to John Adams that we should have a military academy in which "the whole theory of the art of war should be taught." The official idea for the United States Military Academy at West Point was born a short time later in a report he drew up for Congress.


Knox spent the winter of 1777-78 beside Washington at Valley Forge and gave a good account of himself at

Monmouth in 1778. His artillery proved to be the difference at Yorktown and he received the highest praise from Washington for his leadership at this the last battle of the war.

At the conclusion of the war, Knox was the first officer to embrace General Washington and bid him a fond farewell at Fraunces Tavern.

He became the commander of the fort at West Point in August 1782. From Washington's resignation on 23 December 1783 until his own on 20 June 1784 he was the senior officer of the Army.

With the war's end, Henry Knox, still a young man, was at the "end of the beginning" of his long and distinguished career in the public service. After returning briefly to business in Boston, Knox became the Secretary at War under the Articles of Confederation and was kept in the same position (called now Secretary of War) under Washington's administration.

He died suddenly on 25 October 1806 as a consequence of having swallowed a chicken bone. 

CPT Richard L. Heit is Assistant S3 of the 1st Battalion, 80th Field Artillery.

During the eight short years Henry Knox was Washington's Chief of Artillery, he endeared himself not only to his beloved commander but also to countless generations of artillerymen as the "father of the American Artillery." The name "Knox" is attached to at least nine counties in as many states. There are towns or cities of Knox, Knoxville, or Knox City in at least nine states. The name is perpetuated at Fort Knox, Kentucky, and at Fort Sill there is a Knox Road and a Knox Hall.



A SHAWL for the infantryman?

A Special Hard-Target Assault Weapon LAW (SHAWL) is being developed to put an effective assault weapon into the hands of the individual infantryman. The experimental SHAWL is an 8½ pound free-flight rocket system that contains two warheads in tandem on the front of an in-tube burning rocket motor. The weapon can be carried by one man and has a throwaway launcher, requiring no maintenance.

SHAWL can be delivered to a range of 200 meters from cover or inside a room (in lieu of running out into the open and trying to throw the grenade through a window or hole in the wall). The SHAWL rocket impacts the target wall (figure 1) where the dual-cone crush switch initiates the front warhead. The front warhead makes at least a two-inch hole in the target wall which allows the follow-through warhead and spent motor case to pass through the hole (figure 2). The second (follow through) warhead is exploded inside the target by means of a time delay fuze, spraying lethal fragments throughout the room.

SHAWL is definitely not an antitank weapon. Tests show that a shaped charge warhead capable of defeating tank armor makes only a small hole in masonry walls; unless the person in the room is directly behind the hole, he probably would not sustain injury.

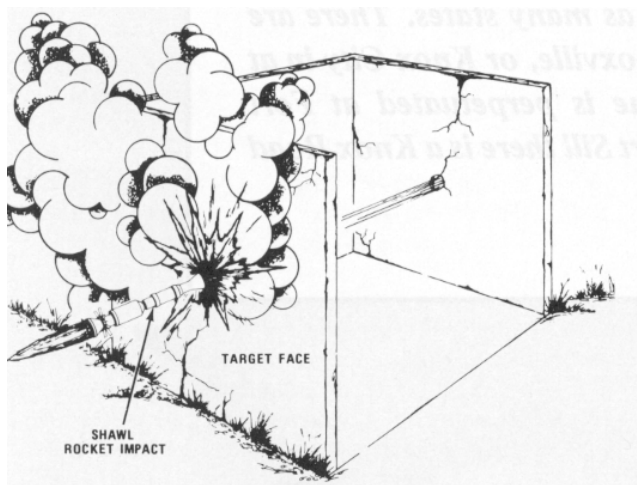


Figure 1. SHAWL impact.

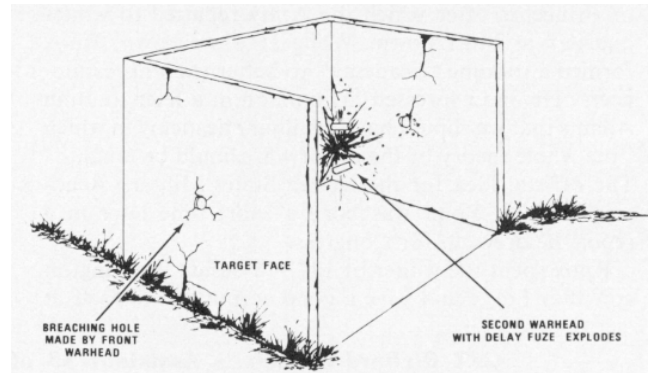


Figure 2. SHAWL target penetration.

The experimental program is scheduled for completion within the next 16 months. In late FY80 or early FY81, SHAWL is scheduled to enter a shoot-off competition against four other systems contending for the infantry assault role. Competition will not only show what is available, but will allow the Army to give the soldier the best possible weapon. (Extracted from an article by William E. Zecher in *Army R, D & A* magazine)

84th does it again!

The 84th Transportation Company, 260th Quartermaster Battalion, was recently selected by the National Defense Transportation Association (NDTA) as the "Best Transportation Unit of the Year." This is the third year in a row that the 84th has received this award.

Nicknamed the "Roadrunners," the 84th is an Active Army light-medium truck company, whose primary mission is to support the 1st (Ranger) Battalion, 75th Infantry.

Each Army (FORSCOM) installation nominates a transportation company to go for this award, and the 84th has been selected by Fort Stewart for the last three years. To receive the NDTA award, a unit must qualify in certain areas, such as high standard of readiness, accomplishment of unit training requirements, excellence of maintenance of equipment, excellence in supply discipline, mission accomplishment, community and civic action, and safety performance.

Lasers, not bayonets, on M16's?

In June 1980, selected Army combat units will begin receiving the Multiple Integrated Laser Engagement System (MILES) which may prove to be particularly effective in simulated combat training exercises. The newly devised system consists of a laser, logic box, and a series of laser detectors for each weapon system. Each laser is "set" to duplicate the characteristics of the weapon on which it is mounted.

For example, the laser on an M16 rifle has a maximum effective range of 460 meters, the same as that of an M16 rifle firing ball ammunition. Mounted on a TOW, it has a maximum effective range of 3,000 meters, the same as a live TOW missile. In this configuration, the system has a 100 percent probability of "killing" an armored personnel carrier and 90 percent chance against a tank.

The lasers are eye safe and present no health hazard, so no safety equipment is needed. A common nine-volt battery provides the power.

MILES is a discrete laser system. Each logic box can determine hits, near misses, and kills.

If one infantryman fires at another and "kills" him, a constant tone goes off in the harness of the "killed" soldier. To stop the tone, a yellow key is inserted into a device on the harness of his web gear. By turning off the tone, he also turns off his laser. If the key is removed, the tone returns but the laser still will not fire. A special key, carried only by observers, must be used to reset the system and put the soldier back in action.

A "near miss" sets off a two-second tone in the soldier's ear to indicate he must take some type of action, such as moving to another location.

The laser will fire only when a blank cartridge in the weapon fires. This way, realistic ammunition loads can be carried and used. If a soldier runs out of blanks, his laser simply won't fire.

For a tank, Hoffman devices mounted on the gun tube give off a blast that simulates the main gun firing. Additionally, each laser can be set to shut off automatically after firing a preselected number of rounds.

Each vehicle configured with MILES has both a strobe light and tone emitters. The strobe is placed on the outside of the vehicle and will blink continuously if the vehicle is "killed."

The Army is studying how best to capitalize on the capabilities of MILES for enhancing unit tactical training and proficiency. All the common mistakes made in training can be seen, such as vehicles moving over the crest of a hill or personnel staying in the open too long. Soldiers will know what they did wrong and will have an experience to remind them.

The US Army Combat Developments Experimentations Command (CDEC), Training and Doctrine Command (TRADOC), and Xerox

Corporation are preparing to conduct final tests of the system. Initial equipment issue is scheduled to begin in June 1980 to the Infantry School, Armor School, National Training Center, and 8th Infantry Division in Germany. (Extracted from article by James Arnold, *Fort Ord Panorama*)



PVT Donald L. Stewart of CDEC's Armor Company C demonstrates the MILES infantry harness assembly. The laser, mounted on the barrel of the M16 rifle, can be set to fire a predetermined number of times and then shut itself off. (Photo by Bob Hubbert)

Armor unit marks 61 years of service

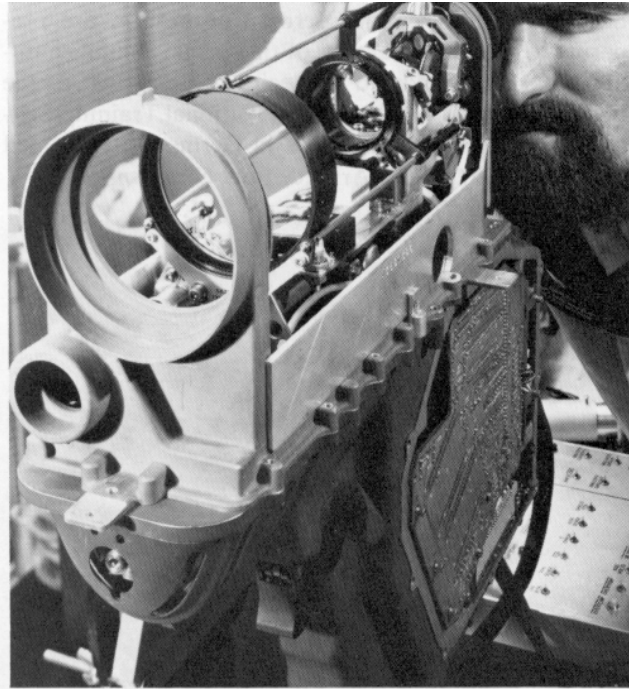
The oldest tank battalion in the US Army recently marked 61 years of continuous service.

On 12 September 1918, the 1st Battalion, 66th Armor (then the 326th and later the 344th Tank Bn), conducted the first American tank attack in history at St. Mihiel with small, French-made Renault tanks.

In addition to its World War I battles, the 1st Bn, 66th Armor, was used extensively in World War II as a part of the 2d Armored Division. The "Iron Knights" participated in the invasion of French Morocco in North Africa; in June 1944, they invaded "Fortress Europe," landing on the Normandy beach on D-Day plus three.

On 10 November 1951, the unit joined the 24th Infantry Division in Korea, where it received eight campaign streamers for actions throughout 1953.

More recently, the battalion participated in two 6-month Brigade 75 trips to Germany, the Division Restructure Study at Fort Hood, and the National Training Center test earlier this year.



The Marine "MULE." (Hughes photo)

Marines get MULE

Optical alignment is adjusted on the first engineering development model of a new laser device that will enable US Marines to pinpoint targets with devastating precision both for conventional artillery and for laser-guided weapons. Shown is the Modular Universal Laser Equipment (MULE), developed by Hughes Aircraft Company. The man-portable, tripod-mounted MULE provides accurate range information and designates targets for all laser-guided weapons now operational or under development. Hughes is constructing 10 engineering development models of MULE under a contract managed for the Marine Corps by the US Army Missile Research and Development Command. Following delivery late this year, the MULE systems will undergo six months of operational test and evaluation prior to a production decision.

Engineer battalion receives unit citation

The state of Pennsylvania's first award of the Governor's Unit Citation was presented last month to the 876th Engineer Battalion of the Pennsylvania National Guard for its flood fight efforts during the 1977 Johnstown Flood.

The 876th was cited for outstanding professionalism while handling emergency operations and providing assistance to flood victims. The disaster left 73 people dead and 7,000 homeless and caused more than \$200 million in damages.

Corps of Engineers becomes a MACOM

The Army Corps of Engineers recently became a Major Army Command (MACOM), consisting of the engineer division and districts, research and development laboratories, and other field agencies. The new MACOM, however, does not include members and units of the Corps of Engineers' branch of the Army, such as combat, construction and facility engineers and other engineer organizations with other major commands.

Establishing the Corps as a MACOM is expected to improve the understanding and use of available corps services and resources as well as leading to increased readiness and providing for a rapid transition from peacetime to wartime engineer support during mobilization.

New mine clearing roller

The first production units of the Army's new mine clearing roller system have been released from Chrysler Corporation's Centerline, MI, Defense Operations Facility. The roller system, developed by the US Army Mobility Equipment Research and Development Command (MERADCOM), Fort Belvoir, VA, is capable of all weather, day and night rapid assault breaching of defended enemy minefields.

The system, which consists of roller assemblies, a removable mounting kit, and two hand winches, is designed for tank mounting. The roller can be mounted by a tank crew in 15 minutes using the winches. After breaching a minefield, the roller can be quickly released from inside the tank by the driver using a hydraulic disconnect system.

The rollers destined for armor units in Europe will undergo pre-production testing at the Army's Test and Evaluation Command at Aberdeen Proving Ground, MD, and follow-up evaluation by the Training and Doctrine Command at Fort Hood, TX.



The Army's new mine clearing roller system mounted on a tank.

IFVs and CFVs on the way!

Models of the XM2 Infantry Fighting Vehicle (IFV) and the XM3 Cavalry Fighting Vehicle (CFV) are being tested at Aberdeen Proving Ground, MD, and Fort Carson, CO.

At Aberdeen the new vehicles will undergo technical testing, while Fort Carson will be used for crew training and operational testing by soldiers.

Both vehicles are designed to provide capability with the XM1 main battle tank and are slated to replace the M113A1 in mechanized infantry and armor units. Delivery of production vehicles to the field is expected in 1981.

The IFV and CFV are essentially the same except for minor differences in crew size, weapons, and ammunition capacity. Each has a two-man turret which mounts four 25-mm cannons, a coaxially mounted 7.62-mm machinegun, and a two-missile TOW launcher. A 500-horsepower, turbo-charged, diesel engine gives the vehicles a top speed of over 40 miles per hour.

The IFV carries a driver, commander, gunner, and six riflemen. The riflemen can fire individual weapons through the six firing ports at targets to the sides and rear. The IFV also carries seven antitank missiles, 900 rounds of 25-mm ammunition, 4,400 rounds of 7.62-mm ammunition, and 6,150 rounds of 5.56-mm ammunition.

The CFV carries a five-member scout crew, 12 TOW missiles, 1,500 rounds of 25-mm ammunition, 7,700 rounds of 7.62-mm ammunition, and 1,460 rounds of 5.56-mm ammunition.

SOTAS contract awarded

The Electronics Research and Development Command (ERADCOM) recently awarded a \$54+ million contract to Motorola Inc.'s Government Electronic Division, Tempe, AZ, to design and develop four Stand-Off Target Acquisition System (SOTAS) engineering development models. The major subcontractor will be Lockheed Missile and Space Co., Sunnyvale, CA, and Computer Science Corp., Moorestown, NJ.

SOTAS is an airborne radar surveillance and target acquisition system which can detect and locate moving targets beyond the forward edge of the battle area during day and night operations under most weather conditions. It consists of a moving target indicator (MTI) radar system mounted in a YEH-60B Blackhawk helicopter which provides a data link from the helicopter to ground display stations. The ground display stations, housed in standard Army vehicles, receive, process, store, and display the MTI data. Information is displayed in real time with sufficient accuracy to permit strike by Army ground and Air Force support weapons systems.



An Air Force A-10 makes a firing run during the TASVAL test. The Department of Defense directed test involves Air Force A-10 and F-4 jets. Army AH-1S Cobra TOW helicopters, and Marine Corps A-4 jets and AH-1T helicopters against a Threat organized armor unit. TASVAL is designed to find out effectiveness and survivability rates of these various aircraft when employed in an antiarmor role.

New jammer to protect helicopters

A contract for over \$11½ million was recently awarded by the Army Electronics Research and Development Command (ERADCOM) to Sanders Associates, Inc., Merrimack, NH for production of the AN/ALQ-14A jammer. The contract calls for production of 450 units to be delivered in 18 months.

The AN/ALQ-14A is a small, lightweight, omnidirectional infrared (IR) jammer, designed to protect small and medium size Army helicopters from both ground-launched and air-to-air IR missile threats. It has four configurations, each consisting of a transmitter and control unit weighing less than 30 pounds.

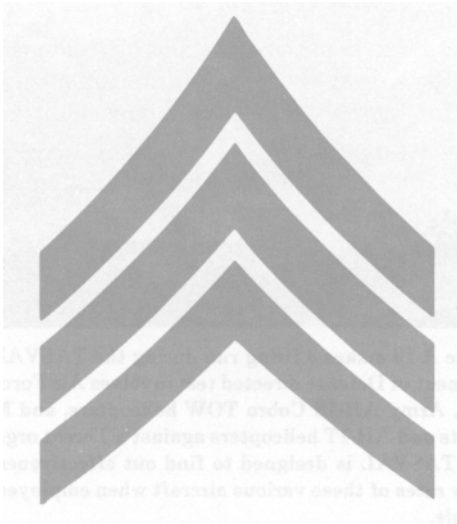
2-2d Inf gets training—Canadian Army style!

Recently, 97 Fort Lewis soldiers had a chance to try soldiering—Canadian style.

Members of Company C, 2d Battalion, 2d Infantry, were flown to Calgary, Alberta, on 12 May joining forces with our Canadian Allies to participate in WAIN-CON 79. The participation by American troops in the six-week Canadian brigade field training exercise was designed to familiarize US soldiers with the weapons and tactics of the allied army.

The training was an exchange exercise for both armies. While the 2-2d Inf was training in Canada, Company A of Princess Patricia's Canadian Light Infantry trained at Fort Lewis using American weapons and ammunition.

Members of the 2-2d Inf found that going to the field with the Canadians was a somewhat different experience. For example they were most impressed with the fact the live fire exercises were really "live fire" using real APCs.



The SQT: Sergeant's Business

by LTC John M. Grimshaw

The advent of the Skill Qualification Test (SQT) began a continuing series of challenges for field artillery leaders and training managers. The 1, 1st Airborne Division (Air Assault) Artillery at Fort Campbell, KY, has produced a viable SQT program that raises the proficiency of both the field artillery soldier and NCO. Although the Fort Campbell method is equally valid to all specialties, primary focus thus far has been on the high density field artillery MOSs 13B, 13E, and 82C. In particular, management of the 13B and 13E hands-on component (HOC) training and evaluation has had the most significant impact on the overall air assault division artillery training program and will be the focus of this article.

Until September 1978, emphasis on the SQT was at battery and battalion levels:

- Plans were mapped out for teaching all tasks in the Soldier's Manuals in a logical progression.
- Training schedules were annotated to reflect training by task number.
- Job Books were issued to section chiefs and their usage became an item of command interest.
- Some units conducted diagnostic evaluations of their SQT training.

In September 1978, the 101st Airborne Division Artillery commander expressed a need for centralized direction of the SQT program at div arty level, so he called on the NCO expertise in his headquarters. The div arty command sergeant major (CSM) assumed staff responsibility for the SQT program in coordination with the div arty S3. The CSM appointed E8 test site control officers for MOSs 13E and 82C, but he retained responsibility for the 13B program with the div arty operations sergeant acting as his deputy. The CSM supervised the selection of all test site control personnel through the four battalion command sergeants major.

Units began selecting dates for the formal SQT evaluations to begin in January 1979. A practice HOC SQT for MOSs 13B, 13E, and 82C was scheduled for mid-December. A planning group was formed consisting of the div arty S3, CSM, and test site control officers to review the Manuals For Hands-On Components (MA-HOC) and insure that essential test site personnel and equipment were available. Each test site was established at least two days before the practice SQT. All test site personnel were evaluated to insure compliance with MAHOC standards at each station, and a system was established to control the flow of tested personnel between stations at the test site. Great care was taken to insure that the conditions of the test site established for the practice SQT would be the same as for the formal

Table 1. SQT performance

MOS	Grade	80% or above	60 to 80%	Less than 60%
13B	E5	50 (96.1%)	2 (3.9%)	
	E1-E4	237 (72.5%)	60 (18.4%)	30 (9.1%)
	Total:	287 (75.7%)	62 (16.4%)	30 (7.9%)
13E	E6	12 (100%)		
	E5	13 (62%)	4 (19%)	4 (19%)
	E1-E4	35 (43.8%)	20 (25%)	25 (31.2%)
	Total:	60 (53.1%)	24 (21.2%)	29 (25.7%)

Note: This table graphically shows SQT scores by grade and MOS. The first figure is the number tested. The figure in parentheses is the percentage represented by the number tested. These scores are extracted directly from the HOC test booklet and do not reflect a final official tabulation. They are provided for illustrative purposes only.

SQT; therefore, only those persons who had a retainability through March 1979 were selected as test site personnel. A written component for each SQT was prepared for administration at battalion level.

The practice HOC SQT was extremely valuable because it gave the commanders, soldiers, and SQT staff a picture of the difficulties ahead. Each soldier was provided individual test results, and battalion commanders were given an overall assessment of results grouped by MOS and task. This alerted the chain of command as to the extensive training required to achieve a satisfactory performance level on the formal SQT. Major observations resulting from the practice SQT were:

- Soldiers did not do well on the HOC evaluation; e.g., assembly/disassembly of the M60 machinegun and all FADAC operations.
- Administration of the 13B test site required virtually all assigned 13B NCOs (E5 through E7).
- The most efficient way to prepare for the formal SQT was to identify a three-week period and focus virtually all div arty training time and resources toward SQT requirements.
- Test site control duties, although an enormous drain on each battalion's personnel assets, provided an excellent means of quality control for "training the trainer." These same NCOs prepared the soldiers for the formal SQT.

All soldiers were permitted another practice SQT under actual test condition just before the formal SQT.

This final "tune-up" served several purposes:

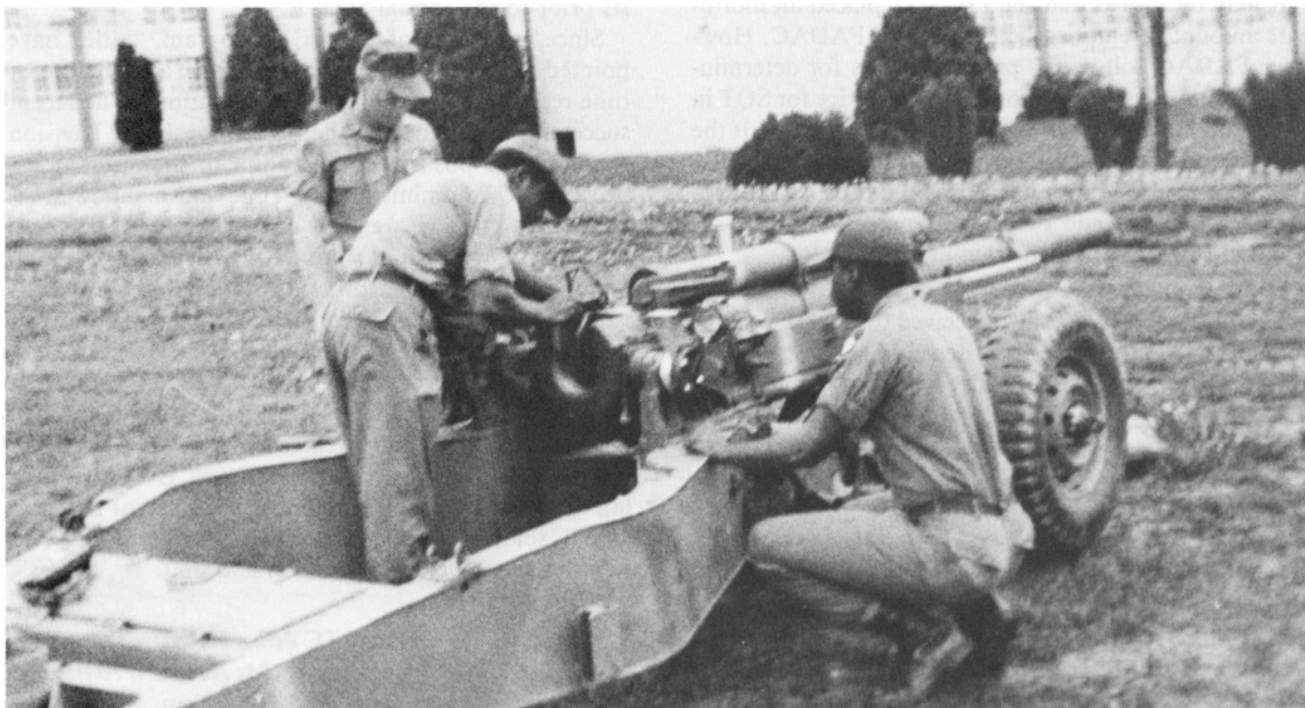
- It served as a dress rehearsal for the test team.
- Soldiers were familiarized with test site administrators, procedures, and conditions, thus minimizing the fear or uncertainty experienced by many soldiers prior to testing or competition.
- Problem or weak areas were identified in time for a final training push before the formal SQT.

Formal SQTs were administered in February and March. Each direct support battalion (80 to 90 testees) was allotted 1½ days; the general support battalion (132 testees) was allotted two days because of the larger 155-mm howitzer section.

The results of the 13B HOC were especially significant: 92.1 percent of the soldiers tested at least verified their MOS (i.e., in terms of HOC only, achieved a score of at least 60 percent); 75.7 percent scored at least 80 percent, which means, in terms of HOC scores only, they were qualified for promotion to the next higher grade.

In MOS 13E, 74.3 percent of the soldiers tested at least verified their MOS in HOC testing and 53.1 percent achieved a score of at least 80 percent, demonstrating they were qualified, in terms of HOC testing, for promotion to the next higher grade. Table 1 shows SQT scores by grade and MOS for 13B and 13E.

The results of the March 1979 formal SQT provide useful lessons and observations for consideration by the Field Artillery Community:



An M102 gunner performs an end-for-end test as part of his formal SQT evaluation.

- The roles of the division artillery and battalion command sergeants major and first sergeants in selecting test site administrators, organizing test sites, and overall supervision are of paramount importance to the success of the program.

- The test results show clearly that the "trainers were trained" based on their individual scores and the equally impressive scores of the soldiers.

- Initial results indicate that written component scores are lower than hands-on component scores.

Composition of a representative practice written component test for each MOS is considerably more difficult than designing a hands-on component test. Compounding the problem is the variance of reading levels among younger soldiers. There is considerable merit to the proposal to eliminate or reduce the weight of written component evaluations for grades E1 through E4 in MOSs 13B, 13E, and 82C. In the meantime, steps can be taken to provide soldiers more practice in undergoing written MOS evaluations. For example, a card file of test questions, answers, and references can be compiled and maintained by the div arty S3. (Each unit is tasked for input, based on assigned SQT areas.) Questions, answers, and references are verified by other units. The resultant reference library permits a unit to structure an examination whenever it chooses to administer a practice written component SQT. Such a system requires periodic review, updating, and purging of reference cards.

It may be argued that the 13E SQT placed an inordinate amount of emphasis on the use of FADAC. However, FADAC will be the primary means for determining firing data for a few more years. Practice for SQT in a 105-mm howitzer unit would be eased, however, if the FADAC program were structured to the unit's weapon instead of the 155-mm howitzer as required on the formal SQT. This would obviate the necessity for reprogramming FADAC for unit training.

Little emphasis was to "non-artillery" MOSs (e.g., 63B, 76Y, and 91B) that also received their SQT evaluations during 1978. These low density MOSs should be integrated into a division artillery SQT program.

The remainder of the 101st Airborne Division Artillery 1979 SQT program will reflect the experience of the March testing program. Artillery-related SQTs will be administered during August, with non-artillery SQTs (e.g., 31V, 36K, etc.) slated for approximately the same time. The div arty S3 will continue to schedule tests and act as point-of-contact for SQT policy and training administration. As in the past, the div arty command sergeant major will serve as the test control authority. He will appoint all test site control personnel and supervise administration of both the practice and formal SQTs.

Points-of-contact within division artillery for non-artillery SQTs have been designated. Although there is a division-level SQT proponent for each non-artillery MOS, the div arty point-of-contact will assist soldiers in their SQT preparations and coordinate diagnostic evaluations prior to the formal SQT. These in-house evaluations will be conducted by staff officers or technicians appropriate to each MOS.

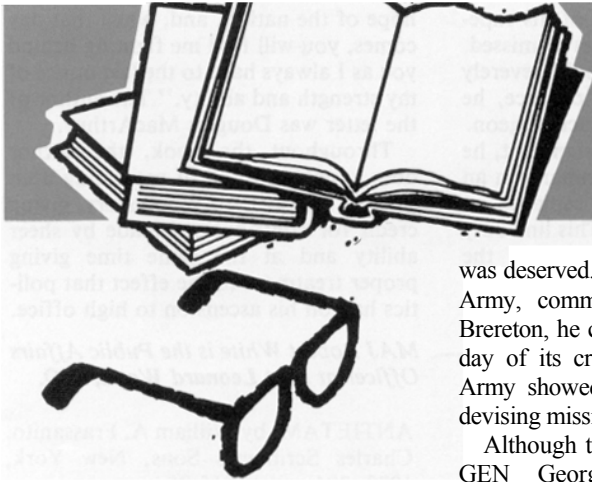


Hands-on testing of M102 cannoneers.

In all cases, the goal is a full-scale practice SQT at least one month before the formal evaluation to prepare test site personnel and identify areas for training emphasis prior to the formal SQT.

Since inception of the SQT program, critics have pointed to the large number of personnel and amount of time required to administer the evaluations. The recent successful experience of the Screaming Eagle Division Artillery is a positive counterpoint to the negative aspects of SQT administration. Time and manpower expenditures must be weighed against results. Hands-on component evaluations were clearly successful from an administrative and performance standpoint. The NCO-run SQT validated the belief that training of the individual soldier is "sergeant's business." The visible, high quality NCO performance in completing their SQTs, preparing the soldiers for their evaluations, and administering the test site greatly enhance the prestige of the 101st Airborne Division Artillery NCO Corps. Most importantly, the SQT raised the proficiency of the individual soldier, thereby increasing the readiness and fighting capability of his section and unit. ❌

At the time of writing, LTC John M. Grimshaw was S3, 101st Airborne Division (Air Assault) Artillery. He is now Commander, 2d Battalion, 20th Field Artillery, at Wiesbaden, Germany.



Redleg Review

A SOLDIER'S STORY, by Omar N. Bradley, Rand, McNally & Company, Chicago, 1978 (1951), 656 pages, Paperback, \$6.95.

I first read *A Soldier's Story* some 20 years ago. At that time it seemed like the best of all the books by military men to emerge in the post-World War II period. More than two decades of time have not diminished that appraisal. General Bradley proves himself to be a candid, honest chronicler, as well as a proficient and lucid writer. Unlike many other books, ghost written for prominent military figures by professionals, this book is the product of the author's own abilities.

This 1978 edition contains a foreword by Bill Mauldin, the famed cartoonist and commentator on the American scene. Mauldin's opening sentence of this foreword says it all: "Omar Bradley is one of the few superstars in American military history who never thought of running for president." Mauldin goes on to say that the modest, self-effacing Bradley did not believe that was the job for which he had been trained. One need only to read this book to discover that for which this fine gentleman had been trained.

Bradley does not attempt to conceal his feelings concerning other figures of prominence in the European theater. For example, he expresses his admiration for GEN Sir Harold Alexander and does not hesitate to explain both his and Ike's preference for Alexander for command of the British 21st Army Group over Sir Bernard Law Montgomery. Frequently throughout the book Bradley comments on what he considers shortcomings of Montgomery's command methods and strategic moves.

Nor does he spare his fellow Americans from criticism where he believed it

was deserved. Of the First Allied Airborne Army, commanded by LTG Lewis H. Brereton, he comments: "Almost from the day of its creation, this Allied Airborne Army showed an astonishing faculty for devising missions that were never needed."

Although the author is most critical of GEN George Patton's methods of operation and command idiosyncracies, Bradley shows his objectivity by his comments late in the book concerning Patton's handling of the battle for Bad Kreuznach. The 4th Armored Division had advanced rapidly through the Hunsruck Mountains and had reached the Nahe River near Bad Kreuznach. There Patton ordered a halt and sent up reinforcements. Although others urged Patton to push on, General Bradley cautioned his staff to have faith in Patton's abilities. When the 4th Armored was hit by a heavy counterattack, Patton's foresight had saved the day. Bradley made note of this by saying, "Intelligence had not indicated the imminence of that attack but George had anticipated it with the curious intuition that helped make him a great field commander."

As a division, corps, and Army group commander, General Bradley remained governed by the rudiments of effective command he had learned early in his career from no less a teacher than GEN George C. Marshall, the wartime Chief of Staff and later a most honored statesman. These tenets were quite simple: "When an officer performed as I expected him to, I gave him a free hand. When he hesitated, I tried to help him. And when he failed, I relieved him."

While many commanders in all theaters of operations had their brushes with the press, sometimes to their own detriment, General Bradley managed a relationship which promoted mutual trust and understanding. His openness and honest treatment of the gentlemen of the news media paid off handsomely for his Army Group. He notes that although many times the press appeared better informed than his staff, not once did a newsmen accredited to Bradley's command violate any of the confidences to which they were privy.

In the same frank manner with which this entire volume is written, General Bradley comments on British-American relations during the war. He believes that strainings are endemic to Allied command.

One need not be a history buff to enjoy this fine book. The writing style is such that the story itself makes for entertainment as well as education. Many histories written from personal experiences tend to become self-aggrandizements of the authors rather than candid, objective chronicles of events. This is definitely not the case here. *A Soldier's Story* is just what the title indicates—a frank, open account of the wartime encounters of a great soldier told in a language any other soldier can understand. If you haven't read the book, do so.

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

A SHORT HISTORY OF THE VIETNAM WAR, edited by Allan R. Millett, Indiana University Press, Bloomington, Indiana, 1977, 169 pages, \$3.95 (paperback).

Between 1964 and 1972, the United States was actively engaged in one of its most controversial wars. Ambivalent public opinion at home, coupled with a confused political community, prevented either a military or political resolution of the Vietnamese problem. The war in Indochina was not the only war where the United States was at odds with itself. Intense public and political factionalism shadowed both the War of 1812 and the Mexican War of 1848. The turmoil of the general public, an erratic diplomatic policy, and a military caught in the middle are subjects addressed in Allan R. Millett's *A Short History of the Vietnam War*.

In the preface, Millett states that his intention is to provide both the general reader and the student with an objective, concise picture of the war. To achieve this, he compiled and edited 11 essays which dealt with facets of America's participation in Southeast Asia. For example,

Redleg Review

Ward Just offers a description of a firefight from the perspective of a man being shot at, and Henry Allen discusses the problems of social readjustment for the Vietnam veteran. Other essays present views on the political and social impact of Vietnam. For further reading and study, Millett offers a select bibliography on the war.

Professor Millett should be commended for his attempt to place the war in its proper historical and diplomatic context. His book, however, cannot be supported as a true history of the war. Most of the essays in the book were initially printed as supplements to the *Washington Post*. The majority of the contributing authors were correspondents for the *Post* during the war years. The book, therefore, can more accurately be described as one assessment of the Vietnam war by a group of contemporary journalists and observers. To benefit the student or the general reader, a true history must be an objective evaluation of the documents and a critical assessment of the writings and commentaries of the time.

An objective history of the Vietnam war might not be possible for some years. Until that time, a balanced set of essays by contemporary observers can be used to give the reader some grasp of the problems of the time. This book can be effectively used in this respect.

Larry D. Roberts, a former artilleryman, is now pursuing a doctorate in history at Oklahoma State University.

ARMED PROGRESSIVE—GENERAL LEONARD WOOD, by Jack C. Lane, Presidio Press, San Rafael, CA, 1978, 276 pages, \$16.95.

The offices held by GEN Leonard Wood are enough in themselves to whet the appetite of the military reader—Army surgeon, commander of the famed Rough Riders, Military Governor of Cuba, Army Chief of Staff, Presidential candidate, and Governor-General of the Philippines.

However, the real story is not in the fact that he served in these roles, but in the manner in which he attained these prestigious positions and the methods he used to discharge the duties of each. In examining his ascendancy and his duty performance, two items emerge which describe his life—controversy and politics.

Controversy was with him from the very start—it even played a key role in his decision to enter the Army. As a young intern, he ran afoul of his superiors in the

hospital and was dismissed. Realizing this dismissal would severely limit a successful medical practice, he joined the Army as a contract surgeon.

During his first Army assignment, he had the opportunity to command in an Indian campaign when he replaced an incapacitated line officer. This line duty convinced him to transfer from the Medical Department to a line officer in the Regular Army. He then began his "politicking" by cultivating the friendship of GEN Nelson A. Miles who later became Commanding General of the Army and influenced Wood's assignments.

During the next 12 years there were some very important "unofficial" events in his life. He married the niece of a Supreme Court Justice; became very close friends with Assistant Secretary of the Navy, Theodore Roosevelt; served as the family physician of the Secretary of War; and became closely acquainted with President McKinley.

In 1898 when war with Spain became a virtual certainty, Wood teamed with Roosevelt and they used their considerable political influence to guarantee themselves prominent roles in the war effort. The Rough Riders were formed with Wood as commander and Roosevelt as his second in command.

From this point, Wood's career moved with startling rapidity. He was elevated over 509 senior officers to become a brigadier general in the Regular Army. He continued to use his political connections to accelerate his advancement and was probably more closely aligned with partisan politics than any other American general.

Despite some just criticism, achievements were accomplished by other than political connections. General Wood made some very important contributions to the Army and the nation through his abilities and foresight. He firmly believed that any ordinary citizen could be turned into a soldier capable of defending his country in a very short time if given intense, high quality training. His citizen-soldier concept bears a striking resemblance to today's "total Army." He campaigned for military preparedness with almost evangelistic zeal when pacifism was the popular theme. Just how much Leonard Wood influenced the future of the Army is a matter of conjecture, but the fact that he made some significant contributions cannot be denied. One young officer wrote in a personal letter to Wood, "The day will come when you will be the hope of the

nation, and, when that day comes, you will find me fighting behind you as I always have to the last ounce of my strength and ability." The author of the letter was Douglas MacArthur.

Throughout the book, the author does a masterful job of presenting both sides of the Leonard Wood story, giving credit for contributions made by sheer ability and at the same time giving proper treatment to the effect that politics had on his ascension to high office.

MAJ Robert White is the Public Affairs Officer at Fort Leonard Wood, MO.

ANTIETAM, by William A. Frassanito, Charles Scribner's Sons, New York, 1978, 304 pages, \$15.95.

In this "Photographic Legacy of America's Bloodiest Day," the author has accomplished what may be considered an ambition of every Civil War buff. Through painstaking research and on-the-scene work, he has matched 95 battlefield photographs by Alexander Gardner and James F. Gibson—taken immediately after the battle—with modern photos of precisely the same locations. Where possible, he has used the same camera position and lens angle.

With this work, he has pinpointed the exact whereabouts of units and individuals who fought at Antietam where 26,000 Union and Confederate soldiers were killed and wounded, making 17 September 1862 the bloodiest single day in American history. To Confederates, it was the battle of Sharpsburg.

In addition to recreating the battle through photographs, the work includes vignettes of the personal lives of a number of soldiers from both sides, who died or were wounded in the battle. The author follows these individual soldiers from their birthplaces, through young lives, enlistment in the Army, assignment to military units, their locations and activities in the battle, where they fell, and where the dead are buried.

By reducing the war to the fate of particular individuals, the author is able to magnify it to show the scope of suffering of the entire battle and to present the true subjects of the photographs in the book.

This work is recommended enthusiastically for Civil War and military history buffs and scholars.

William F. Finnegan, formerly Assistant Editor of the Field Artillery Journal, is now Editor of the All Volunteer magazine.

—FRAGMENTS—

During daily review of what sometimes seems to be a mountain of newspapers, messages, announcements and other magazines, I can't help but envy fellow editors who enjoy the luxury of being able to devote a column or half page to "what's coming in the next issue." How nice it must be to receive enough quality material to be able to layout and plan an issue ahead, instead of fighting contract deadlines and wondering until the last minute if there will be sufficient good copy to fill 60 pages.

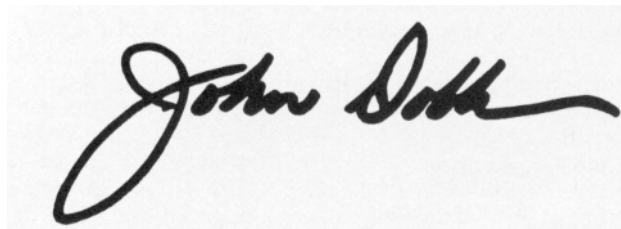
As indicated by results of our recent readership survey, the demand of material is greater than supply, and only through the support of our readership can this situation be remedied.

Perhaps the summer months with field duty, vacations and other outdoor activities are to blame for the recent slowdown in writer contributions. Whatever the reason, now is the time for each of our readers to generate renewed interest in the *Journal*, so that *we* can maintain a high quality, professional magazine.

In this issue you will notice changes which are a result of a critique of the *Journal* conducted last spring at the Department of the Army periodicals conference. The general recommendation was "stick to simplicity and consistency in layout and logo design." Although content remains first order of importance, these alterations hopefully will better present our product.

The recent retirement of Sergeant Major of the Army William G. Bainbridge brought an end to a long and distinguished career of one of this nations top soldiers.

While serving together at the Sergeants Major Academy at Fort Bliss, TX, I knew SMA Bainbridge to be an individual with a never ending source of enthusiasm, humor and downright common sense. His goal there was simple—to improve the professionalism of the Army's Corps of Noncommissioned Officers. This I feel he accomplished, both at the Academy and later as the Army's top enlisted representative.

A handwritten signature in black ink, appearing to read "John Doherty". The signature is written in a cursive, flowing style with a large initial "J" and a long, sweeping underline.