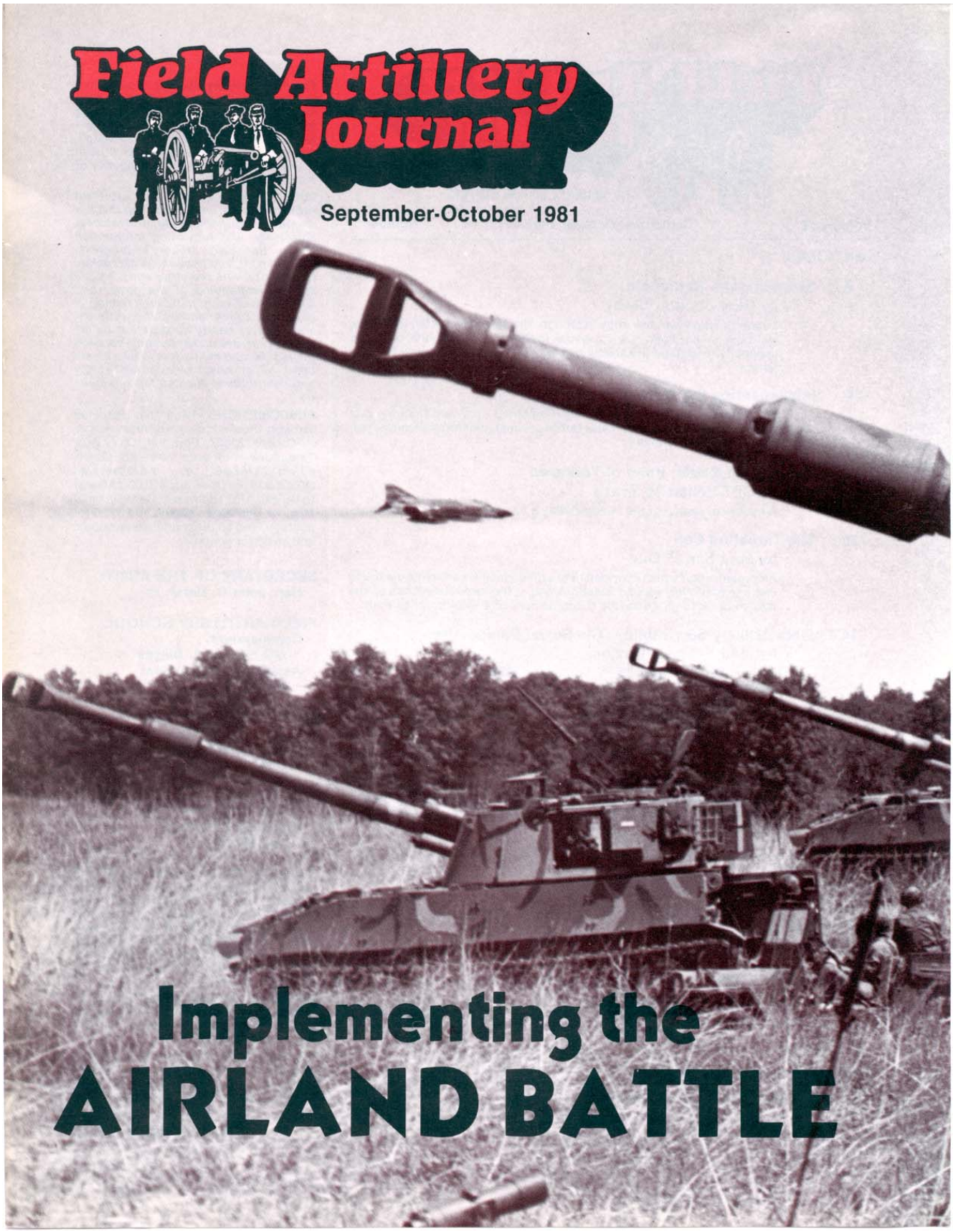
Field Artillery Journal

September-October 1981



Implementing the AIRLAND BATTLE

Field Artillery Journal

THE JOURNAL OF FIRE SUPPORT

Volume 49 **September-October 1981** **Number 5**

ARTICLES

FEATURES

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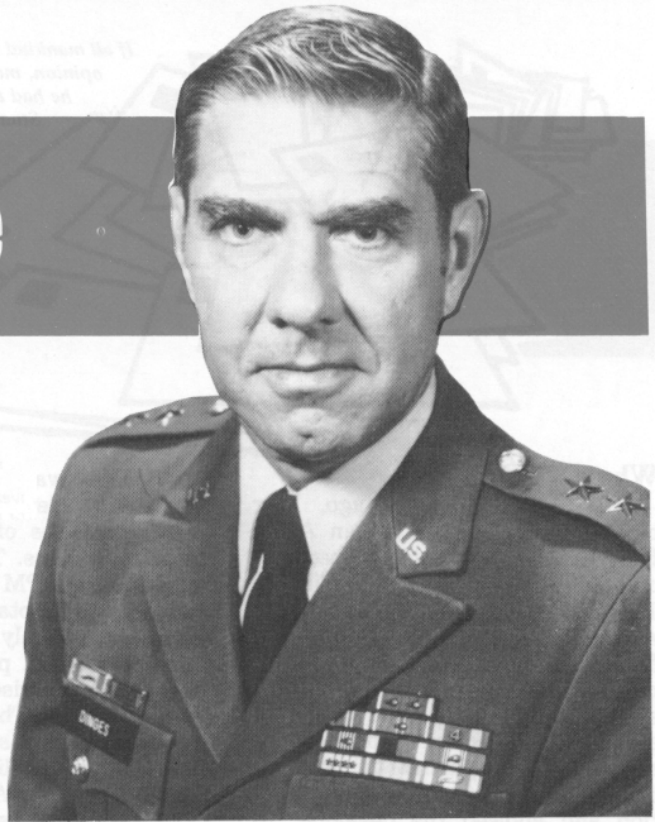
On the Move



by MG Edward A. Dinges

Readers of the *Journal* will have noted during the past year a number of articles dealing in one way or another with the attack of deep targets. This concern for the problem of defeating a deeply echeloned opponent has not been limited to the field artillery. In March of this year General Donn A. Starry, then commander of the US Army Training and Doctrine Command, published an article in *Military Review* entitled "Extending the Battlefield." The article argued the need for fighting both first echelon and follow-on forces concurrently and suggested some of the key requirements of such an integrated battle.

The tactical principles advanced in General Starry's article have since been embodied in both the latest revision of FM 100-5, "Operations," and in a major new TRADOC Operational Concept known as the AirLand Battle Concept. Because of the concept's impact on the planning and conduct of tactical operations, and since there is widespread agreement among the Army's leadership that implementation of the concept must begin *now,* with today's assets, we are reprinting General Starry's article in this issue of the *Journal,* together with a companion piece suggesting some of the implications of the AirLand Concept for fire support. Together, I hope, these articles will stimulate your thoughts on how we can best contribute to the execution of the AirLand Concept.

At the heart of this concept is the conviction that, to defeat a numerically superior opponent free to dictate the opening conditions of the battle, the US Army must do more than just react to the initiative of the enemy. At best, such a reactive strategy would lead to a battle of attrition, in which larger numbers would eventually prevail. To avoid that, we must find a way to take the initiative from the enemy by disrupting his plan of operation and forcing *him* to react, thus multiplying our own more limited combat power by swiftness and surprise. In turn, that implies detecting and striking enemy forces with increasing intensity from the moment they appear on the battlefield until their remnants are committed to the frontline battle.

In short, as General Starry's article suggests, the AirLand Concept implies a single battle fought in great depth, from the line of contact to the furthest reach of our ability to detect and engage targets—a battle during which our whole purpose is to insure that the ultimate collision of maneuver forces takes place on our terms rather than the enemy's.

Of course, lending depth to the battlefield has always been an acknowledged responsibility of the field artillery. Until recently, however, neither our target acquisition capabilities nor the reach of our weapons was sufficient to permit more than superficial execution of that task.

With the fire support coordinator (FSCOORD) assigned the responsibility to manage *all* fire support (including tactical air support) and, more particularly, with the development of new systems like Firefinder, SOTAS, RPV, and MLRS, management of fire support in depth has become as possible as it is essential. To make it happen, however—and more importantly to insure that deep fires contribute to rather than compete with the conduct of the frontline battle—several management issues need to be addressed and resolved. Some of these issues are articulated in "Implementing the AirLand Battle." Among the more critical are:

•Where, at each supported echelon, should targeting be managed to balance the competing requirements of responsiveness and effective integration of fires with maneuver?

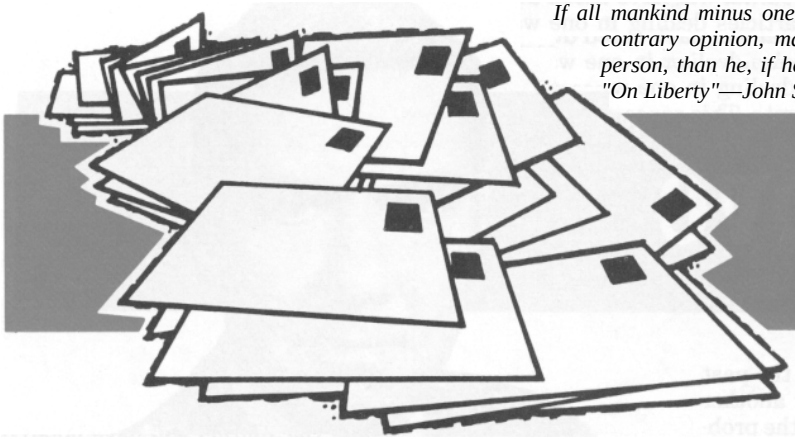
•What improvements are required in tactical air support planning, request, and strike control procedures to insure the requisite high level of ground-air fire support integration?

•Given the competing demands on the fire support system (close support, counterfire, and interdiction), how should we determine the most appropriate distribution of fires in a given tactical situation, and what allocation procedures are required to produce it?

•Anticipating that, within any target category, there are likely to be more potential targets than weapons to engage them, how, where, and by whom should the engagement decision be made to maximize the contribution of fires to execution of the tactical plan?

•Since, particularly for deep targets, the responsiveness of fires may be critically affected by fire unit positioning, how (and by whom) should that positioning be controlled?

These are, of course, only a few of the questions implied by the extended battle. Others will surface only as we begin to practice the concept. It is for that reason and, because the time to start thinking employment is *before* new technology hits the field, that field artillerymen need to begin *now* to consider and debate the AirLand concept. It is to the stimulation of that consideration and debate that this issue of the *FA Journal* is dedicated.



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

Why TSM?

More than 20 years ago, long before my designation as an Army Research and Development Specialist or assignment as an Assistant TRADOC System Manager, the Army had recognized existing difficulties in the Research and Development (R&D) community. The R&D system had become a very complex and diverse collection of independent agencies and departments which in turn prevented effective communication and allowed the developer to become unresponsive to the user. However, throughout the following years, several significant changes and improvements were instituted in an effort to expand the role and influence of the user within the R&D community.

The first attempt to change the R&D community was a result of the 1962 Army reorganization. Each of the many fragmented or independent agencies were placed under one of two separate commands — the Combat Development Command (CDC) for the user or the Army Materiel Command (AMC) for the developer.

However, many deficiencies continued to plague the R&D community:

•The AMC commander was senior in grade and more powerful than the CDC commander.

•AMC utilized tenured civilians versus CDC's frequently rotating military population.

•AMC controlled the testing and funding for the developmental life cycle of all items.

Because of these inequalities between CDC and AMC, the user remained subjected to the will of the developer.

From 1962 to 1973, there were many procedural modifications attempted to enhance the R&D system. The most successful technique developed by DA was the Project Manager (PM) program, the purpose of which was to intensify and streamline developmental management practices of AMC's major or special projects. These streamlining efforts of the PM program produced an increase in total management control and timely decision-making. Designated PM projects rapidly excelled in comparison to the other projects of AMC. The Project Manager program became so effective and successful in controlling the processes of management in AMC projects that CDC counterparts could not maintain the pace. The developer continued to overwhelm the user.

Another Army reorganization changed the R&D system again in 1973. The command of CDC was eliminated with all R&D activities transferred to the newly formed Training and Doctrine Command (TRADOC) while AMC became the United States Army Materiel Development and Readiness Command (DARCOM). This last major reorganization by the Army alleviated the system's deficiencies and established a structural parity between the user and developer commands. TRADOC and DARCOM were both established as four-star level commands and were permitted to employ R&D tenured civilian workers. Each command was allotted a budget for its individual R&D activities. Most significantly, each command would have to rely on an independent test agency for operational evaluations of developing equipment. For the first time, the user and developer would have to work together throughout an item's developmental life cycle.

The interdependent relationship between the commands created new problems for the user. Originally, TRADOC had not established the necessary internal procedures that would allow the user to effectively utilize the improved channels of communication. Further, no focal point had been designated within TRADOC for developing or monitoring the life cycle requirements of the equipment. As a result, actions had to be staffed through the various TRADOC echelons before a response could be expressed which was time-consuming and often delayed decisions on time-sensitive actions. Frequently, management control and decision effectiveness of the user became casualties within the TRADOC system. TRADOC then had to find a more efficient way to respond to the developer, DARCOM, or as in the past, concede to the developer's whims.

The continued success of the DARCOM PM program did not go unnoticed by TRADOC. The streamlining effects and management control produced by the PM program was regarded as a solution to TRADOC's own complex, internal problems. In 1977, TRADOC instituted the TRADOC System Manager (TSM) program to parallel the PM program. The streamlining effects produced by the advent of the TSM were immediate. Now the user had a single representative focal point and a total system manager within TRADOC.

Today there are 32 TSM offices chartered under the provisions of TRADOC Regulation 71-12. Each of the TSM offices have direct communication with the user through conferences and telecommunications. The TSM represents the user by influencing a system's developmental life cycle through all levels, beginning with the action officer through the Secretary of Defense.

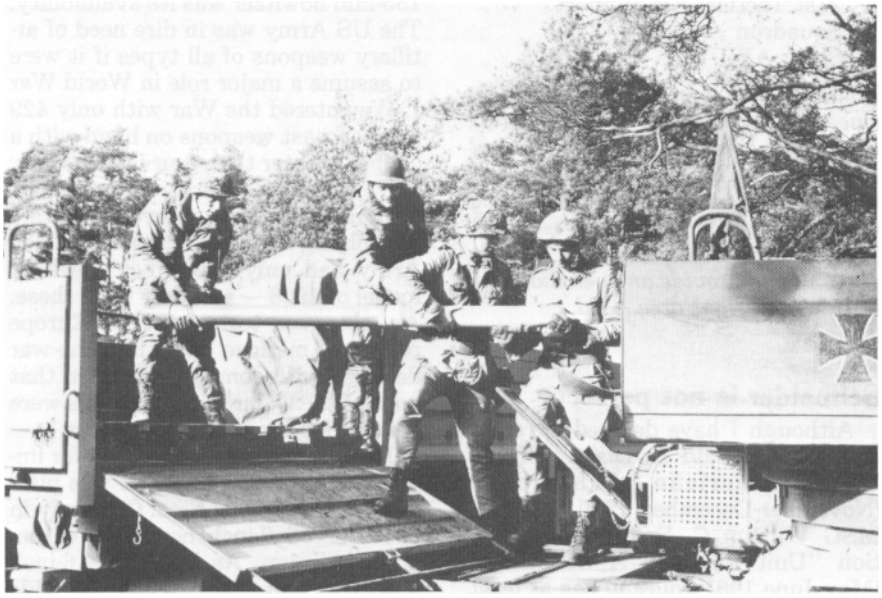
Although still maturing, the TSM offices have become the answer to the old problems that have hampered the user throughout R&D history.

Michael D. Dunn
CPT, FA
PII TRADOC Systems Manager
Fort Sill, OK

110-mm multiple rocket launcher

I am the Commander of the 2d US Army Field Artillery Detachment in support of the 10th German Panzer Division. As such, I have had the privilege of working with the 10th Regimental Artillery which employs the 110-mm rocket launcher that was brought into the German inventory in the early 1970s.

The rocket launcher battalion, "Mehrfachraketenwerfer 110 SF," is organic to every artillery regiment of a German division and consists of two firing batteries with eight launchers. In field operations, each battery is split into two firing platoons of four launchers. Each launcher is mounted on a Kluckner-Hunbolt-Deutz 7-ton truck and manned by a crew of three. The chief is an Unter-offizier (E5) while other section members are usually E1s through E4s. In support of the rocket launcher is a 10-ton truck which carries 180 rockets for ammunition resupply.



Off-loading the rockets from the 10-ton support vehicle. This truck can carry 180 rockets.

Reloading and loading is done by hand. A well-trained crew can reload all 36 tubes in 20 minutes.

Each battery, which has a strength of 79 men, is commanded by a captain, while a lieutenant fire direction officer handles fire missions for both platoons.

The "Mehrfachraketenwerfer" has 36 110-mm rocket tubes that can be fired either singularly or in series of 9, 18, 27, or 36 rockets. (The entire load can be fired in 18 seconds.)

The rocket motor, with a burn time of 2.2 seconds and a maximum effective range of 14 kilometers, can currently deliver four kinds of warheads:

•*Trainer*—produces flash and smoke for observation.

•"*Splitter*"—filled with approximately 5,000 pellets the size of a thumb nail.

•*Antitank*—head contains 8 mines with a choice of two types: type 1 (24-hour self-destruct) or type 2 (variable-time self-destruct from 3 to 97 hours).

•*Smoke*—utilizes wick canisters. The smoke capability is particularly impressive in that a battery firing 72 rockets (9 rockets per launcher) can obscure a 4-kilometer area for 15 minutes.

Targeting requirements are received through forward observers and are planned by the fire direction officer either at the regiment, battalion, or battery. Missions for the batteries are usually made without adjustment. Depending on the type target, the fire direction officer will order either one launcher, platoon, or entire battery to fire. The battalion's fire direction officer can mass the fires of the battalion's launchers.

In conjunction with the division's 155-mm howitzers for each brigade and the regimental 155-mm assets, the 110-mm multiple rocket launcher provides awesome fire support.

Samuel S. Wood Jr.
CPT, FA
Commander
2d USA FA Detachment
APO New York

Reunions

790th Field Artillery Battalion, WWII — October 9-11 at the Menger Hotel in San Antonio, TX. Contact CWO (Ret) C. C. Carraturo, 1 Hydraulion Ave., Bristol, RI 02809.

36th Field Artillery — October 12-14 at the Holiday Inn in Hyannis, MA. Contact Danny Tanous, 25 Knowles Road, Watertown, MA, 02172.

Realistic training

MAJ George Demetriou's "FTX Sankt Georg" represents a model for most *Field Artillery Journal* articles from the field. Take the doctrine into the trenches and see if it can work effectively; then tell other individuals of like interest what was learned.

Few folks in the Field Artillery business ever believed one could relocate a battery 15 to 22 times per day with today's soldiers, equipment, terrain, and weather. The Division Reorganization study is much more realistic in performing the mission with only two to three moves a day.

The real horror story in the next battle is brought to light in the ammunition resupply discussion. Maneuver units will also be requiring the same kinds of POL resupply indicated in the article and will probably have the same kinds of problems. Resupply vehicles are important enough to the fight to have communications equipment for command and control.

Sankt Georg was not only a very worthwhile exercise, it produced a fine article!

K. Patrick Cathcart
TCADD, USAFAS
Fort Sill, OK

TACAIR

I just finished reading your May-June 1981 issue and was elated to find Colonel Dodge's article, "Tactical Airpower: What is it? How does the ground maneuver commander use it?" Being a "Blue Suiter" in the close air support business, I enjoyed the exposure given by Colonel Dodge and the *Journal* staff.

I was privileged to attend the Army Command and General Staff College a couple years ago and have, like Colonel Dodge, had several occasions to ask Army officers their views of tactical airpower and how they might use it. The answers I heard were very similar to those comments in Colonel Dodge's article. I offer no panacea, but where Colonel Dodge suggests an education process for "Redlegs" to become familiar with the capabilities and limitations of TACAIR, I want to help.

The 21st Tactical Air Support Squadron (TASS), located at Shaw Air Force Base, SC, is comprised of officer forward air controllers (FACs) and enlisted tactical air command and control specialists (TACSs). Numerous times we have been tasked to support exercising Army units and have been "under-employed." Please accept this as an open invitation to ask us questions, pick our brains, exploit our knowledge. Controlling airstrikes is only part of our job; liaison is the most important part. So anytime you see a "Blue Suiter" (exercise or otherwise), ask him what he is doing. He will be more than happy to talk TACAIR with you.

Lee Castell
LTC, USAF
21st Tactical Air Support
Squadron
Shaw AFB, SC

Your offer to provide assistance is sincerely appreciated. Should you or other members of the 21st Tactical Air Support Squadron receive questions or requests for information, we here would welcome written feedback. This in turn would allow us the opportunity to provide an open dialogue in this important area.—Ed.

Schneider is not perfect

Although I have delayed in rebutting LTC Ronald E. Olson's article "The American Schneider" (November-December 1980 *Journal),* MSG William C. Brown's contribution "Unit Restores A Schneider" (May-June 1981 *Journal)* has at least stirred my desire to argue the colonel's admiration of the old Schneider.

Lieutenant Colonel Olson's article is overly and unjustifiably complimentary of the Schneider. With its extremely narrow traverse (6 degrees total), limited elevation capability (42 degrees), constant length recoil, and equilibration achieved by the placement of a cumbersome counterweight above the breech, the Schneider cannot be considered the acme of the designer's art, allowing, even, for the state of the art at the time. Desired design characteristics for a post-war 155-mm howitzer stipulated by the Westervelt Board in 1919 included just about every feature lacking in the Schneider. Other Schneider abominations include the US 240-mm howitzer model of 1918 and the Schneider railroad artillery mounts. A copy of the former adorns Fort Sill's Artillery Walk, if memory over 22 years serves me correctly, resembling a giant toy cannon assembled from an enormous erector set. Crewmen of the latter might justifiably curse the complete absence of any on-mount traversing capability, even for fine laying, requiring that the entire mount be repositioned longitudinally along gigantic circular railroads used for laying in direction.

Olson is not alone in his esteem of the name "Schneider" as many other post-war writers were extravagant in their praise of the French artillery and described them as models of weapon perfection. Actually, the major selling point of the Schneider 155-mm howitzer was its availability. The US Army was in dire need of artillery weapons of all types if it were to assume a major role in World War I. We entered the War with only 429 non-seacoast weapons on hand with a caliber greater than four inches. Only half of these were of post-1900 design. For a weapon even remotely resembling a medium howitzer, the Army had only the 6-inch howitzer model of 1908 — and only 42 of these. An observer team sent to Europe prior to American entry into the war declared with some justification that none of the US artillery weapons were suitabe for use in a modern war.

In anticipation for the need for improved artillery, a contract was placed with Bethlehem Steel Company in 1916 for 55 6-inch howitzers of improved design. As built, this 6-inch howitzer had split trails, a wide traverse angle, and a muzzle velocity and range exceeding those of the Schneider. The first copy was partially tested at Aberdeen in 1918 and, as might be expected, several deficiencies were noted. Further work was cancelled due mainly to the availability of the Schneider.

The British Vickers 6-inch howitzer was also considered a candidate for selection by the US. The Schneider was ultimately chosen because of its weight and range advantage over competitor pieces, because of an estimate that carriage manufacture by US firms would be a simpler matter than it actually turned out to be, and because of the very important consideration that the French Government was able to supply early-arrival US troops in France with this materiel. (Of the complete weapon systems ultimately completed by 30 January 1919 for issue to US troops, weapons produced in France outnumbered that in the US by a ratio of more than two to one.)

Some of the markings on the restored Schneider howitzer reported

by MSG Brown are confusing, while others can be easily explained. Perhaps contributions by several readers can clear up the mystery.

First, identification of Rock Island Arsenal with the howitzer carriage is entirely in order since contracts were let with the Arsenal, with Osgood Bradley Car Company of Worcester, MA, and with the American Rolling Mill Company of Homestead, OH, for fabrication of all required carriages for this weapon. The last company mentioned assumed a contract originally issued to the Mosler Safe Company. The Arsenal, however, had not delivered any complete carriages as of April 1919. Suffice it to say that the entire carriage program gave all concerned many more headaches and sleepless nights than had been originally estimated.

While I can offer no explanation for the marking "1942 N.F.R.," it seems reasonable that the weapon could have been modified at Rock Island during 1942. The original American Schneider was equipped with solid rubber tires; MSG Brown's piece obviously has pneumatic tires. This piece has either an M1918A1 or M1918A3 carriage (pneumatic tires, high speed axle and bearings, drawbar, and, possibly, torque rods). Going into World War II, about the time of the fall of France, the US Army had 2,971 old World War I 155-mm howitzers, only 599 of which had been modified for high-speed travel. Production of the M1 155-mm howitzer, probably better known to our younger soldiers as the M114, did not begin until 1942, when only 33 were produced. In light of this, modification of the older weapon as late as 1942 to meet an urgent need appears to be a reasonable action. World War I vintage 155s were used in Italy as late as the winter of 1943-44.

Moving on to the breech and muzzle markings, the breech mark "A.B.S. & Fdy Co; Erie, PA" refers, of course, to American Brake Shoe and Foundry Company, which machined all gun components from forgings supplied by Bethlehem Steel Co., Standard Forgings Co., and Standard Steel Works. Perhaps "T. Beth Steel" indicates that the tube forging was provided by Bethlehem Steel, while "J.S.F. Co. Steel" indicates that the jacket forging was supplied by Standard Forgings Co.

I can find nothing in my files which might explain the mark "J.H.C. & Fdy Co. 1919."

MSG Brown's assumption regarding recuperator markings seems to be reasonable, although one might wonder if the French were still providing recuperators late in 1919 when this particular howitzer was manufactured.

Lest I appear to be hyper-critical of the Schneider 155-mm howitzer, let me state that the weapon was an important factor in the US and allied vic tory in World War I and that the weapon gave noteworthy service in World War II. Let's keep it in perspective, however; the Schneider was not the answer to the artilleryman's prayer, but it was available in the required numbers when needed.

Raymond E. Messier
LTC (Ret), USA
Bellevue, WA

AN/PRC-68

Reference the article on page 57 of the January-February 1981 issue of the *Field Artillery Journal,* I have specific interest in the AN/PRC-68, small unit transceiver.

As a communications chief of a firing battery in a battalion utilizing the split-platoon concept, I would like to verify the necessity for this piece of equipment (AN/PRC-68) — it could play a vital role in survivability during an armed conflict.

Where can I obtain further information on this equipment such as publications and national stock number? Additionally, when is the expected fielding date of the item?

SSG Harry Hernandez
Communications Chief
C Btry, 1-18th FA
APO NY

Training Manual (TM) 11-5820-882-10 provides national stock numbers, publications, and general specifications for radio set AN/PRC-68. The current basis of issue plan (BOIP) page 46, note number 06, specifies that the basis of issue is one per gun section, one per battery commander, one per XO, one per BOC, and one per firing battery fire direction center. The national stock number for the battery (BA 1588/U) is 6135-01-094-6536 (also provides a box of 10 batteries). The hand-held small unit transceiver will appear in European SP battalions in 1981 with the mounted configuration following in early 1983.—Ed.

Hot off the Hotline

Your "Redleg Hotline" is waiting around the clock to answer your questions or provide advice on problems. Call AUTOVON 639-4020 or commercial (405) 351-4020. Calls will be electronically recorded 24 hours a day and queries referred to the appropriate department for a quick response. Be sure to give name, rank, unit address, and telephone number.

Please do not use this system to order publications. Consult your FA Catalog of Instructional Material for this purpose.

Question: When will the first Multiple Launch Rocket System (MLRS) class be offered at Fort Sill?

Answer: *The first cadre course (E6 and above) will start in mid-January 1982. All noncommissioned officers (other than support NCOs will have MOS 15D30 (Lance missile). The filler course (E5 and below) will have MOS 13M. (Multiple Launch Rocket System crewman). This course will start around the first of February 1982.*

Question: Is it possible to fire illumination rounds at high angle. We had problems in safety range impact of the canister. Also, the tabular firing table for the 155-mm howitzer does not have a drift column in the illumination portion. How do you calculate the drift for that type of firing?

Answer: *When computing safety for firing high angle, shell illuminating, use drift corresponding to shell HE since shell HE and shell illuminating are ballistically similar and illumination safety assumes a dud (worst case).*

Extending the Battlefield

The combined capabilities of acquisition, targeting, and weapons systems available to the commander today are astounding. The author contends that these systems, supplemented by new ones being fielded, allow the commander to "see" far beyond the frontline of troops onto an "extended" battlefield, a battlefield upon which the full potential of our weapons must be exploited if victory is to be attained. While the idea of the extended battlefield is not new, the author argues that the extended attack must be an integral part of every Army combat unit's capability.

by GEN Donn A. Starry

THE extended battlefield concept primarily deals with war in areas of the world where there are large numbers of relatively modern, well-equipped forces who use Soviet-style operational concepts and tactics. Quite naturally, therefore, the threat against which the concept is designed is typified by the Warsaw Pact in Central Europe, the larger aggregations of mechanized forces in the Middle East, or the threat from the north in Korea.

The concept emphasizes the all too frequently ignored or misunderstood lesson of history that, once political authorities commit military forces in pursuit of political aims, military forces must win something, or else there will be no basis from which political authorities can bargain to win politically. Therefore, the purpose of military operations cannot be simply to avert defeat, but, rather, it must be to win.

This article does not propose new and radical ways to fight the battle to win. Rather, it describes an extension of the battle and the battlefield which is possible to accomplish now and which, if applied, will reinforce the prospects for winning.

The extended battlefield is not a new concept. It is a more descriptive term for indicating the full potential we must realize from our acquisition, targeting, and weapons systems. The battlefield and the battle are extended in three ways: First, the battlefield is extended in depth, with engagement of enemy units not yet in contact to disrupt the enemy timetable, complicate command and control, and frustrate his plans, thus weakening his grasp on the initiative.

Second, the battle is extended forward in time to the point that current actions such as attack of follow-on echelons, logistical preparation, and maneuver plans are interrelated to maximize the likelihood of winning the close-in battle as time goes on.

And, lastly, the range of assets figuring in the battle is extended toward more emphasis on higher level Army and sister service acquisition means and attack resources.

What emerges is a perception of the battlefield in which the goal of collapsing the enemy's ability to fight drives us to unified employment of a wide range of systems and organizations on a battlefield which, for corps and divisions, is much deeper than that foreseen by current doctrine. The word "doctrine" is used advisedly. It must be acknowledged at the outset that there is probably little set forth in this article which is not already being done and done well in some operational units. The purpose of this article is less to suggest innovation than it is to pull together many good ideas for making extended attack an integral feature of our combat capability—in all units.

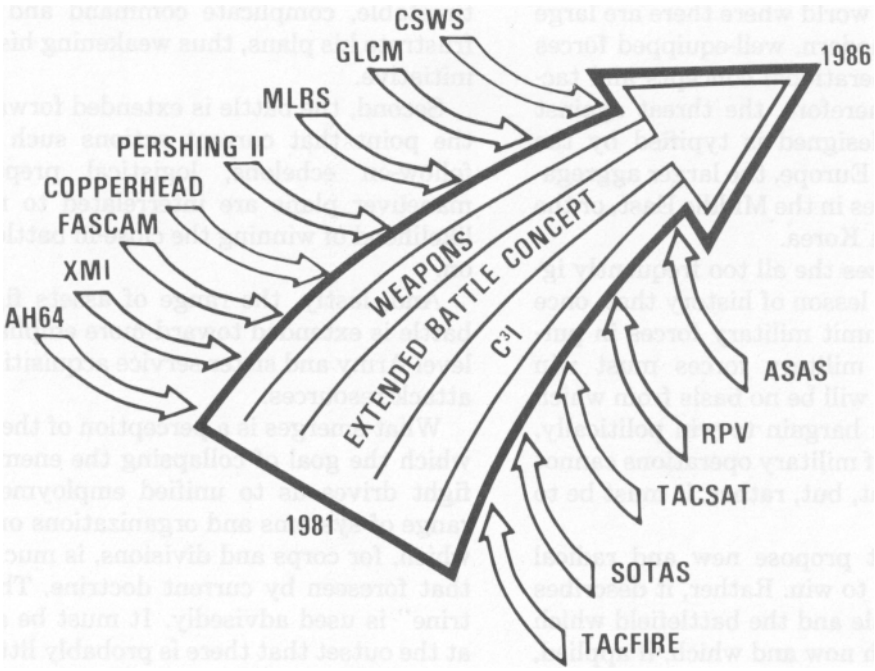
In essence, our message can be distilled in four primary notions:

•First, deep attack is not a luxury; it is an absolute necessity to winning.

•Second, deep attack, particularly in an environment of scarce acquisition and strike assets, must be tightly coordinated over time with the decisive close-in battle. Without this coordination, many expensive and scarce resources may be wasted on apparently attractive targets whose destruction actually has little payoff in the close-in battle. The other side of this coin is that maneuver and logistical planning and execution must anticipate by many hours the vulnerabilities that deep attack helps create. It is all one battle.

•Third, it is important to consider now the number of systems entering the force in the near and middle-term future (figure 1). These are not just weapons of greater lethality and greater range, but automated systems and communication systems for more responsive command control, as well as sensor systems to find, identify, and target the enemy and to assess the effectiveness of deep attack.

•Finally, the concept is designed to be the unifying idea which pulls all these emerging capabilities together so that, together, they can allow us to realize their full combined potential for winning.



C³I (COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE)

CSWS (CORPS SUPPORT WEAPON SYSTEM)

GLCM (GROUND-LAUNCHED CRUISE MISSILE)

MLRS (MULTIPLE LAUNCH ROCKET SYSTEM)

FASCAM (FAMILY OF SCATTERABLE MINES)

ASAS (ALL-SOURCE ANALYSIS SYSTEM (CORPS/DIVISION))

RPV (REMOTELY PILOTED VECHICLE)

TACSAT (TACTICAL SATELLITE)

SOTAS (STAND-OFF TARGET AQUISITION SYSTEM)

TACFIRE (TACTICAL FIRE DIRECTION)

Figure 1. A substantial step toward future capabilities.

The extended battlefield is not a futuristic dream to remain on the shelf until all new systems are fielded. With minor adjustments, corps and divisions can and must begin to learn and practice fighting the extended battle now—during 1981. The payoffs in readiness for combat will be enormous, and implementing the concept today means that we are building the receptacle into which every new system can be plugged immediately, minimizing the buildup time to full capability.

To insure that the extended battlefield concept is understood in the full context of the integrated conventional-nuclear-chemical battlefield, this article will first review, in a broad sense, major aspects of the concept. Then, it will describe how, by attacking assaulting and follow-on echelons simultaneously, the prospects for winning increase dramatically.

The concept

In peacetime, the purpose of military forces, especially in the context of operations in areas critical to US interests, is to reduce to a minimum whatever incentives the enemy's leadership might perceive as favorable to seeking military solutions to political problems. In NATO, the Middle East, and Korea, our defensive strategy must extend beyond simply denying victory to the other side. It must, instead, postulate a definable, recognizable (although perhaps limited) victory for the defender. Enemy leaders must be made to understand clearly that, if they choose to move militarily, no longer will there be a status quo ante-bellum—something to be restored. Rather, the situation they themselves have created is one which will be resolved on new terms.

As the strategic nuclear balance teeters, so grows the enemy's perception of his own freedom of action at theater levels—conventional and nuclear. Theater forces should not be considered solely as a bridge to strategic nuclear war. They are weapons which must be considered in the context of a war-fighting capability.

These considerations dictate that NATO strategy must, from the outset, be designed to cope with the Soviet conventional-nuclear-chemical-combined arms-integrated battlefield threat. The growing threat of nuclear capabilities elsewhere suggests this strategy to be appropriate in other critical areas as well.

The Warsaw Pact/Soviet-style strategy embraces two fundamental concepts:

•In the first, mass, momentum, and continuous combat are the operative tactics. Breakthrough (somewhere) is sought as the initiator of collapse in the defender's system of defense.

•In the alternative, surprise is substituted for mass in the daring thrust tactic. In NATO, this could involve a number of *BMP* regiments in independent attacks which, without warning, would seek to deny to defending forces the opportunity to get set forward. Both tactics are essentially maneuver-based schemes whose purpose is to disrupt the operational tactics of the defender, albeit by different methods.

The need for deep attack emerges from the nature of our potential enemies—their doctrine and their numerically superior forces. Whether our enemy is stylistically echeloned as shown in figure 2 is not really critical. What is important is that superiority in numbers permits him to keep a significant portion of his force out of the fight with freedom to commit it either to overwhelm or to bypass the friendly force. The existence of these follow-on echelons gives the enemy a strong grip on the initiative which we must wrest from him and then retain in order to win.

NATO strategy (and defensive strategies in other key areas of the world as well) must be designed to preserve the territory, resources, and facilities of the defended area for the defender. In none of the critical areas of the world, those to which US forces are likely to be committed, is there sufficient maneuver room to accommodate a traditional defense-in-depth strategy. The defense must, therefore, begin well forward and proceed aggressively from there to destroy enemy assault echelons and at the same time to slow, disrupt, break up, disperse, or destroy follow-on echelons in order to quickly seize the initiative and go on the offense.

The operative tactics by which US forces seek to implement the operational concept set forth above must provide for quick resolution of the battle under circumstances that will allow political authorities to negotiate with their adversaries from a position of strength. This is so because the enemy generally enjoys a short-term advantage in ability to mobilize additional forces quickly. Clearly, then, one purpose

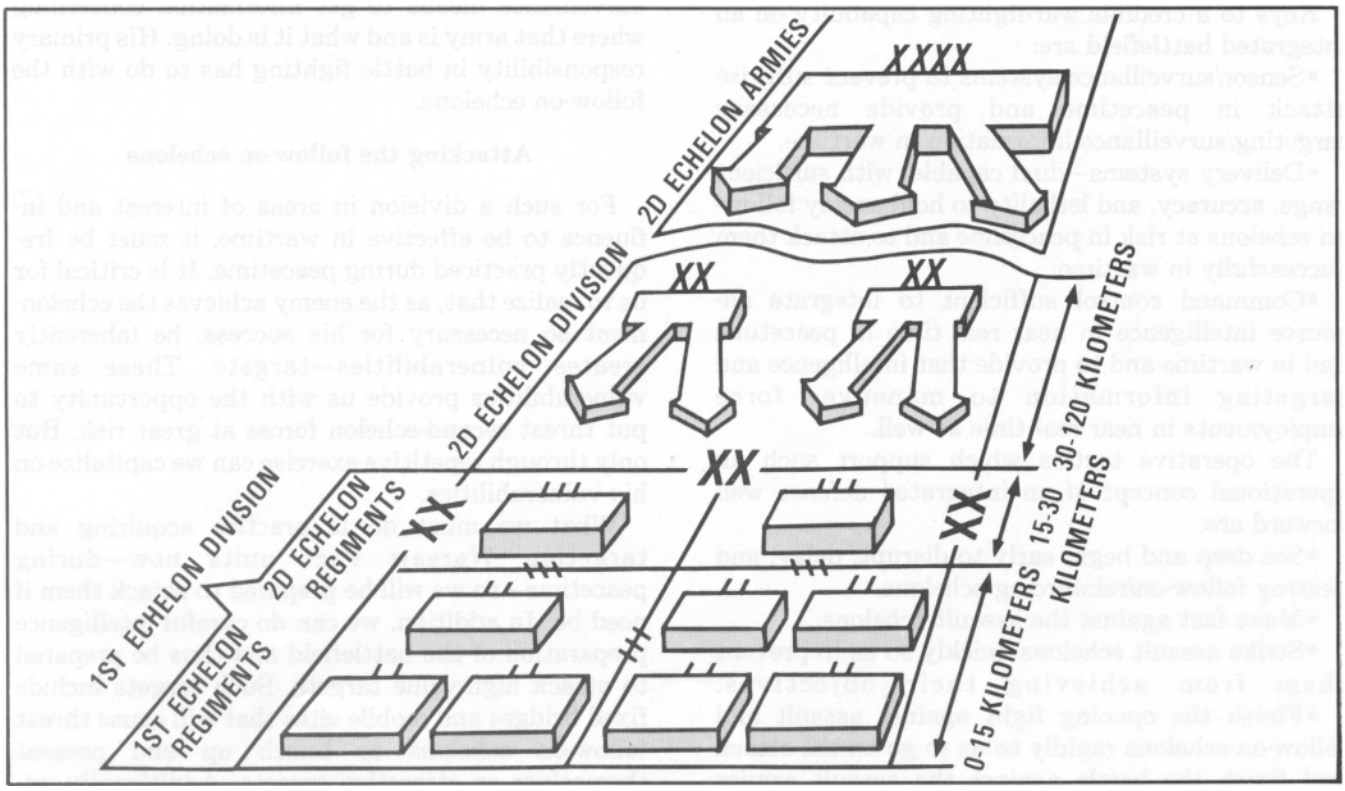


Figure 2. The second-echelon threat.

of the battle concept must be to preempt the possibility of prolonged military operations. Further, these operative tactics should seek simultaneously to:

•Deny enemy access to the objectives he seeks.

•Prevent enemy forces from loading up the assault force fight with reinforcing assault echelons and thus achieving by continuous combat what might be denied them by a stiff forward defense.

•Find the opportunity to seize the initiative—to attack to destroy the integrity of the enemy operational scheme, forcing him to break off the attack or risk resounding defeat.

Because of the enemy's advantage in numbers, attack of follow-on echelons must always begin when those echelons are relatively deep in enemy territory. If an outnumbered defender waits until his numerically superior foe has penetrated the defender's territory to mount a counterattack, it is always too late to bring effective forces and fires to bear to defeat the incursion. This would especially be the case if theater nuclear weapons are considered necessary to defeat the penetration.

Therefore, on an integrated battlefield, systems designed to defeat enemy assault elements, to disrupt follow-on forces, and to seize the initiative by attack must be able to deliver conventional and/or nuclear fires throughout the spectrum of the battle—throughout the depth of the battlefield.

Keys to a credible war-fighting capability on an integrated battlefield are:

•Sensor/surveillance systems to prevent surprise attack in peacetime and provide necessary targeting/surveillance information in wartime.

•Delivery systems—dual capable, with sufficient range, accuracy, and lethality to hold enemy follow-on echelons at risk in peacetime and to attack them successfully in wartime.

•Command control sufficient to integrate all-source intelligence in near real time in peacetime and in wartime and to provide that intelligence and targeting information to maneuver force employments in near real time as well.

The operative tactics which support such an operational concept of an integrated defense well forward are:

•See deep and begin early to disrupt, delay, and destroy follow-on/reinforcing echelons.

•Move fast against the assault echelons.

•Strike assault echelons quickly so as to prevent them from achieving their objectives.

•Finish the opening fight against assault and follow-on echelons rapidly so as to go on the attack and finish the battle against the assault armies before follow-on armies can join the battle.

Areas of interest and influence

In the execution of such a set of operative tactics, there must be a division of responsibilities among commanders. Just as the means with which commanders see and fight the battlefield vary so should their primary areas of interest vary.

As shown in figure 3, each level of command has a dual responsibility. Each must attack one of the enemy's echelons and must see, or determine the intentions of, a follow-on echelon. Doctrinally, we say that the enemy's first-echelon divisions, the regiments in front of the assault divisions, as well as the follow-on regiments, are the responsibility of the defending division.

In an attack, those same echelons would also be the division commander's responsibility. The brigade commander fights first-echelon assault regiments. The division commander fights the first-echelon assault divisions. The corps commander fights first-echelon armies. It is the corps commander's responsibility to find and disrupt the advance of second-echelon divisions of first-echelon armies before they become a part of the first-echelon problem.

At the same time, the corps commander is very interested in where the second-echelon army of the *front* is deploying. At corps level, he must tie into national target acquisition systems and other surveillance means to get information concerning where that army is and what it is doing. His primary responsibility in battle fighting has to do with the follow-on echelons.

Attacking the follow-on echelons

For such a division in areas of interest and influence to be effective in wartime, it must be frequently practiced during peacetime. It is critical for us to realize that, as the enemy achieves the echelonment so necessary for his success, he inherently creates vulnerabilities—targets. These same vulnerabilities provide us with the opportunity to put threat second-echelon forces at great risk. But only through repetitive exercise can we capitalize on his vulnerabilities.

What we must do is practice acquiring and targeting Warsaw Pact units now—during peacetime—so we will be prepared to attack them if need be. In addition, we can do careful intelligence preparation of the battlefield and thus be prepared to attack high-value targets. Such targets include fixed bridges and mobile sites that will cause threat follow-on echelons to bunch up and present themselves as attractive targets. Additionally, attacking other high-value targets such as combat service

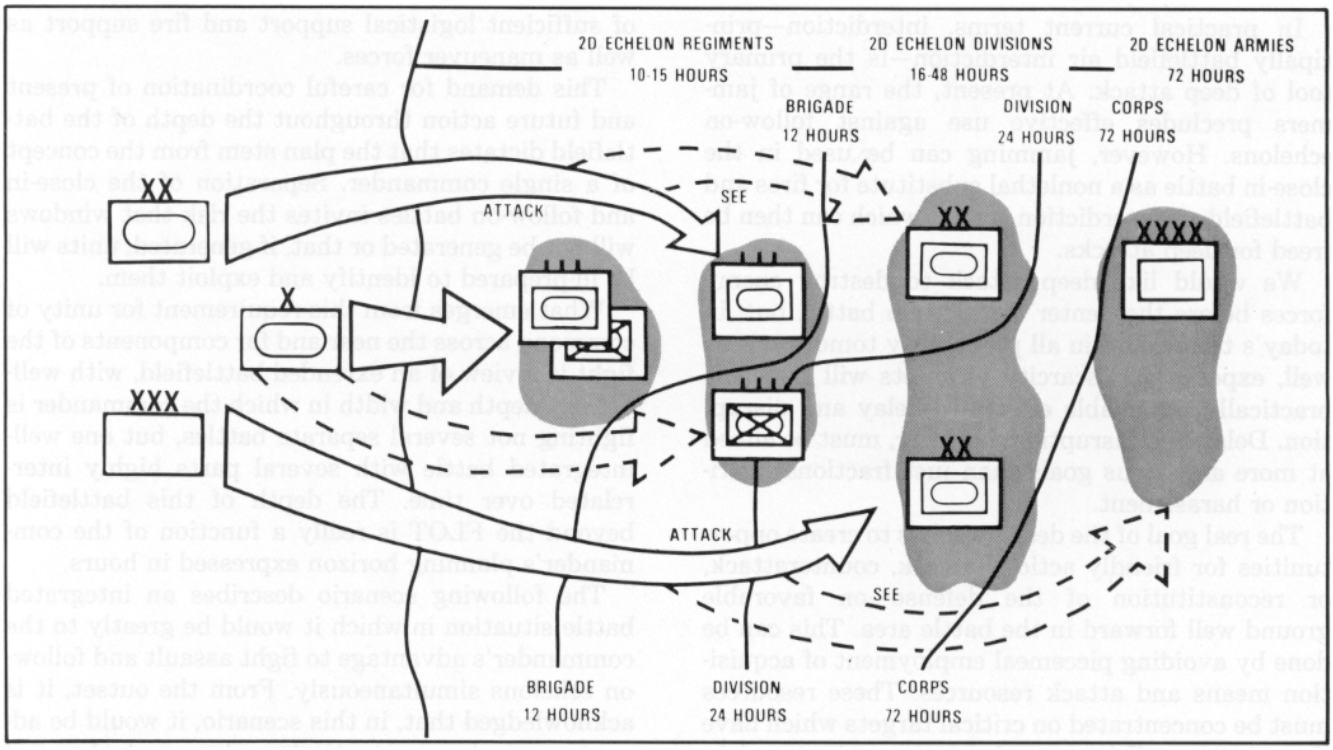


Figure 3. See and attack in depth.

support facilities, which must exist to support rolling forces, or selected command posts, will also generate delay. Attacks directed in this manner will provide friendly forces time to finish the battle at the forward line of troops (FLOT).

Figure 4 shows the problem inherent in fighting against echelonment tactics. If the battle is fought with no directed interdiction, enemy follow-on echelons have a "free ride" until they enter the close-in battle. Figure 4 suggests what happens when follow-on echelons are ignored and allowed to stack up behind assaulting forces at the FLOT until a breakthrough is achieved. The enemy retains flexibility, initiative, and momentum to apply his mass at a point and time of his choice. As indicated by the hachured lines, deep attacks seek to deprive him of this freedom. There are three primary tools for a deep attack:

•Interdiction—air, artillery, and special operating forces.

•Offensive electronic warfare.

•Deception.

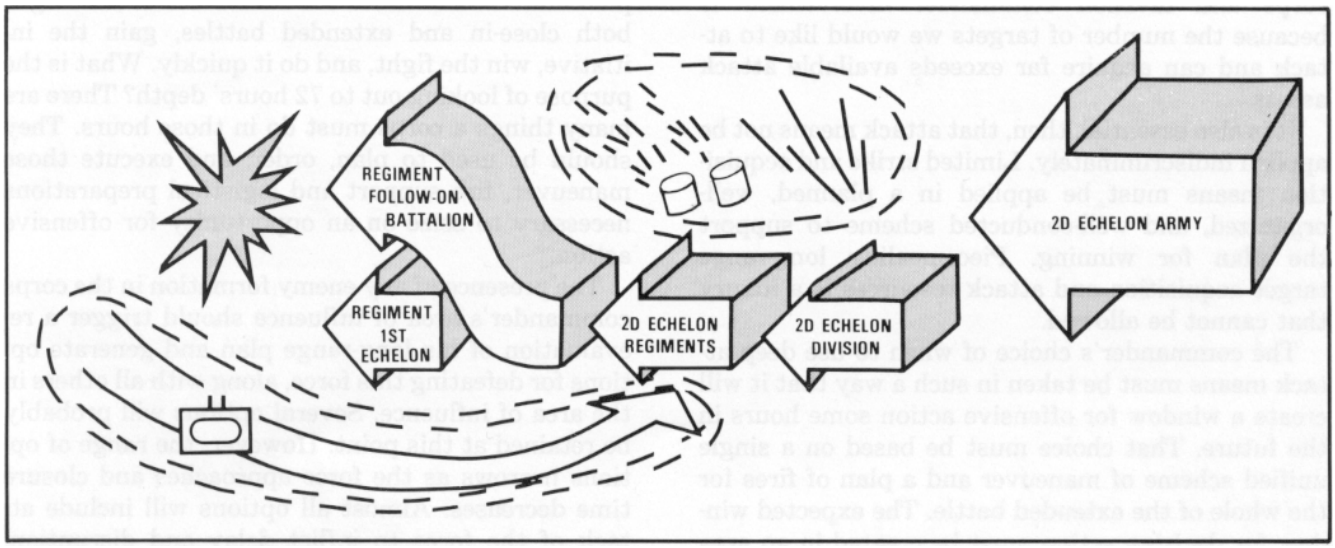


Figure 4. The problem.

In practical current terms, interdiction—principally battlefield air interdiction—is the primary tool of deep attack. At present, the range of jammers precludes effective use against follow-on echelons. However, jamming can be used in the close-in battle as a nonlethal substitute for fires and battlefield air interdiction sorties which can then be freed for deep attacks.

We would like deep attack to destroy enemy forces before they enter the close-in battle, but, in today's terms, and in all probability tomorrow's as well, expense and scarcity of assets will limit the practically achievable effects to delay and disruption. Delay and disruption, however, must be aimed at more ambitious goals than just fractional attrition or harassment.

The real goal of the deep attack is to create opportunities for friendly action—attack, counterattack, or reconstitution of the defense—on favorable ground well forward in the battle area. This can be done by avoiding piecemeal employment of acquisition means and attack resources. These resources must be concentrated on critical targets which have the most payoff in upsetting enemy plans and to create situations wherein the friendly force can seize the initiative and win.

It is important to stress here that the deep attack is not just a tool of the defense. It is, if anything, even more critical in the offense. It is essential to winning because it creates opportunities to seize and retain the initiative. It is equally important that corps and division commanders fight this deep battle at the same time and in close coordination with the close-in battles. It is true that these commanders already have their hands full with the close-in battle, but the compelling reason for active corps and division commander involvement is because the number of targets we would like to attack and can acquire far exceeds available attack assets.

It is also essential, then, that attack means not be applied indiscriminately. Limited strike and acquisition means must be applied in a planned, well-organized, and well-conducted scheme to support the plan for winning. Piecemealing long-range target acquisition and attack resources is a luxury that cannot be allowed.

The commander's choice of when to use deep attack means must be taken in such a way that it will create a window for offensive action some hours in the future. That choice must be based on a single unified scheme of maneuver and a plan of fires for the whole of the extended battle. The expected window for decisive action must be created in an area where previous plans have assured the availability of sufficient logistical support and fire support as well as maneuver forces.

This demand for careful coordination of present and future action throughout the depth of the battlefield dictates that the plan stem from the concept of a single commander. Separation of the close-in and follow-on battles invites the risk that windows will not be generated or that, if generated, units will be ill-prepared to identify and exploit them.

What emerges from this requirement for unity of command across the near and far components of the fight is a view of an extended battlefield, with well-defined depth and width in which the commander is fighting not several separate battles, but one well-integrated battle with several parts highly interrelated over time. The depth of this battlefield beyond the FLOT is really a function of the commander's planning horizon expressed in hours.

The following scenario describes an integrated battle situation in which it would be greatly to the commander's advantage to fight assault and follow-on echelons simultaneously. From the outset, it is acknowledged that, in this scenario, it would be advantageous to use tactical nuclear and chemical weapons at an early stage and in enemy territory. It is also fully realized, however, that authorization to do this may not be granted in timely fashion. And, that being the case, the battle will have to be fought with so-called conventional systems. Even though this somewhat reduces defensive combat power, the concept described here maximizes the remaining conventional power.

Figure 5 portrays the corps commander's concerns in the deep battle—those enemy forces that are within 72 hours of the close-in battle. The corps commander needs to have a well-laid-out, flexible plan and 72 hours into the future in order to fight both close-in and extended battles, gain the initiative, win the fight, and do it quickly. What is the purpose of looking out to 72 hours' depth? There are many things a corps must do in those hours. They should be used to plan, order, and execute those maneuver, fire support and logistical preparations necessary to seize on an opportunity for offensive action.

The presence of any enemy formation in the corps commander's area of influence should trigger a reevaluation of his long-range plan and generate options for defeating this force, along with all others in the area of influence. Several options will probably be retained at this point. However, the range of options narrows as the force approaches and closure time decreases. Almost all options will include attack of the force to inflict delay and disruption. Although distances here are great, the payoff can be

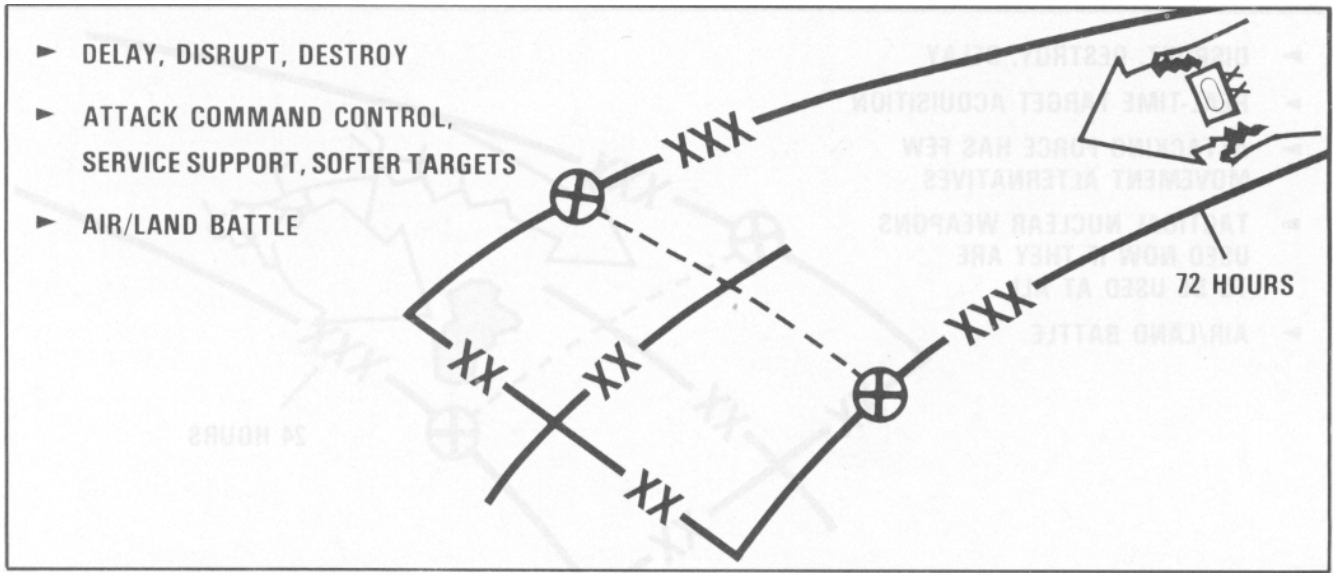


Figure 5. The integrated battle—the deep battle.

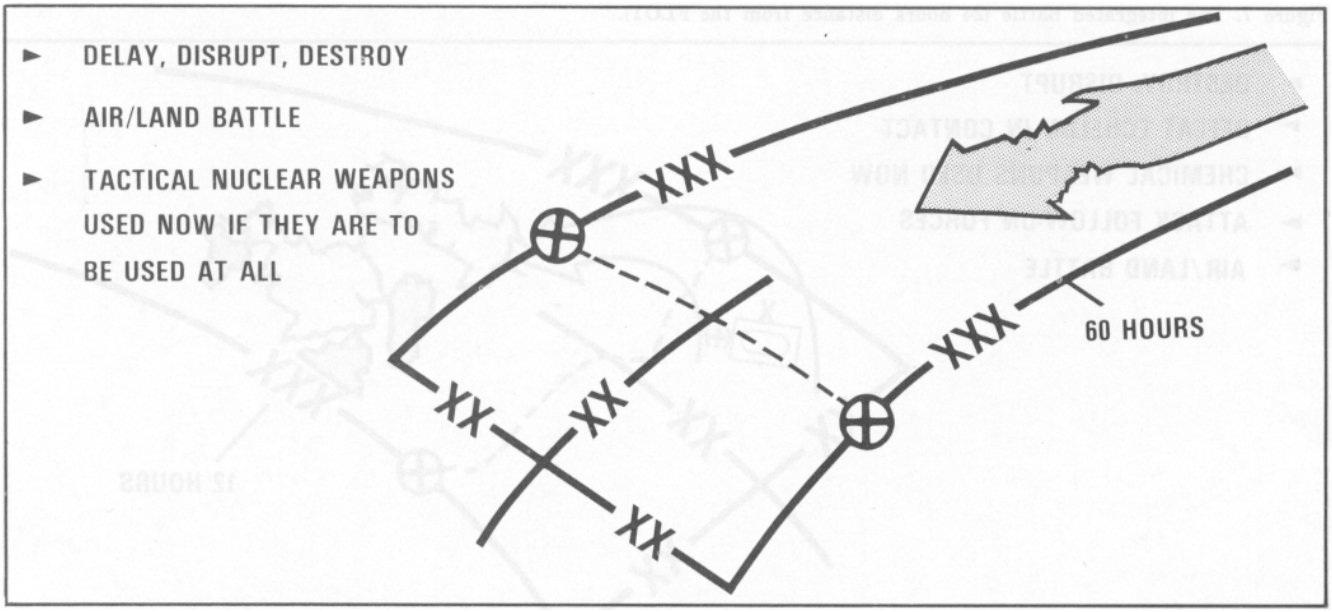


Figure 6. The integrated battle—the corps battle.

considerable since the critical targets include soft-skinned logistical and command control elements whose value will be far less when closer to the frontline battle.

As the force closes (figure 6), its impending impact on the frontline battle will become more apparent, and the relative merits of the various attack options will begin to sharpen. Options at this stage should include deep nuclear strikes with *Lance* or air-delivered weapons. Targets at this stage are far more vulnerable to nuclear effects than at the FLOT. They are still well beyond the danger radius to friendly forces, and the time until closure is realistic enough to allow request release and execution to occur.

Of course, the commander must have a strong conventional option in the event nuclear release is not forthcoming. He must identify the critical time at which he must finally commit himself to one course of action. In any event, he seeks to hold the enemy formation out of the division area of influence long enough for division commanders to have sufficient space and time to accomplish their missions and prepare for the next echelon.

When the force enters the division area of influence (figure 7)—about 24 hours' distance from the FLOT—the entire process is triggered again on a lower scale. Here, the importance of real-time target acquisition dominates. Since, at this point, the attacker is committed to specific attack avenues, he

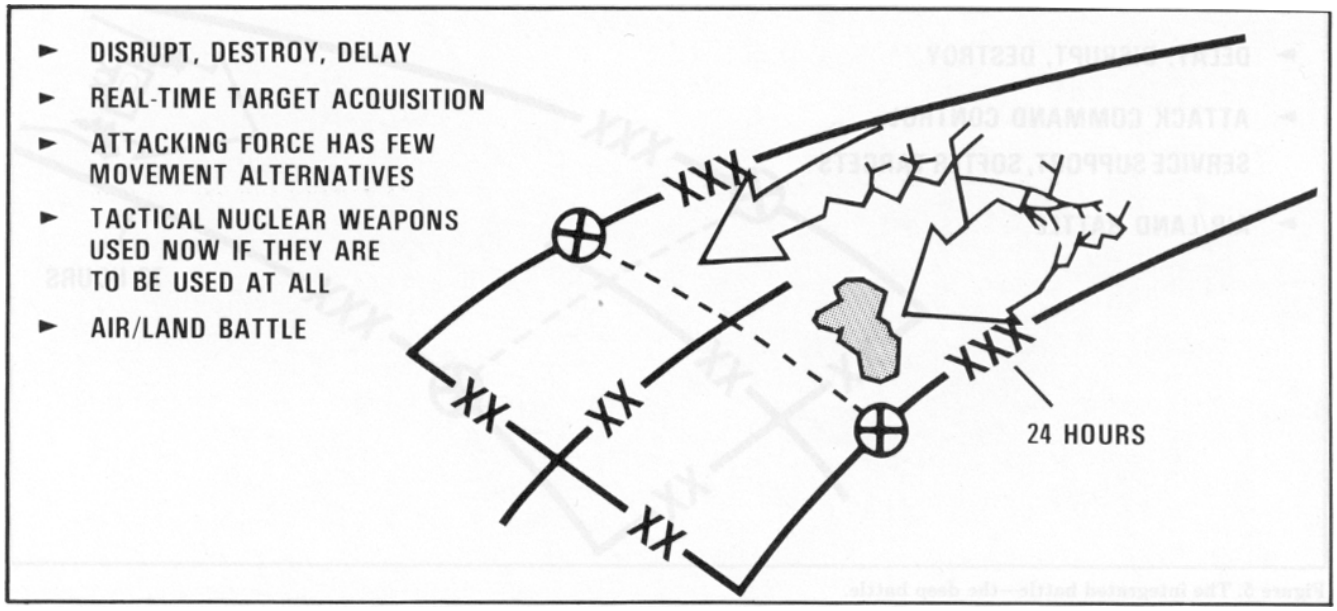


Figure 7. The integrated battle (24 hours distance from the FLOT).

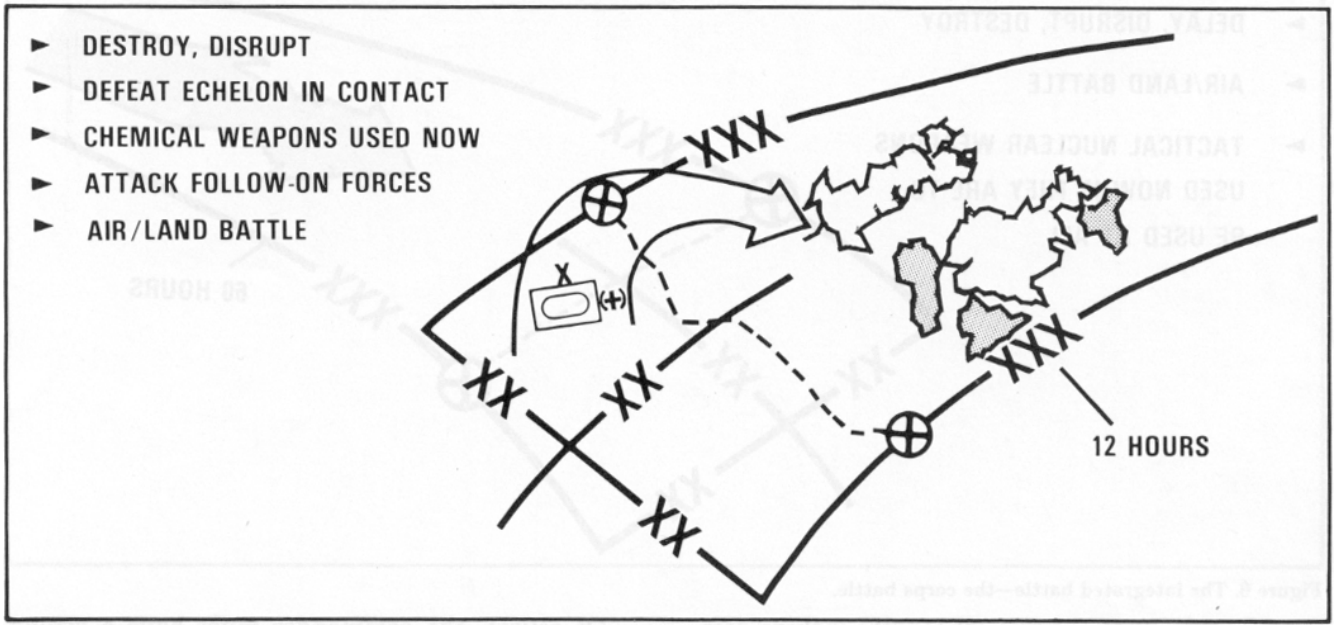


Figure 8. The integrated battle (12 hours distance from the FLOT).

has few movement alternatives left to him. The defender can capitalize on that. Again, if tactical nuclear weapons are to be used, they must be used now.

A review has been made of innumerable planning exercises in which assumed enemy penetrations were drawn with great care to reflect that point "beyond which the integrity of the defense is jeopardized." It was found that, if the penetration was allowed to develop as it was drawn in the defended territory, it was *always* too late. If for no other reason, therefore, it is of paramount importance that the planning process begin while that follow-on echelon target is still deep in enemy territory and that nuclear release be requested in sufficient time to allow employment while the target is still 24 to 60 hours from the FLOT.

As in the earlier part of this battle, the commander must integrate the full spectrum of air and land weapons systems. It is, at this point, still an air/land battle perhaps more air than land, however.

By the time the following echelons close to within about 12 hours of the FLOT (figure 8), they become the concern of the brigade commander. At the 12-hour line, actions must be taken that not only delay and disrupt the following echelons, but also

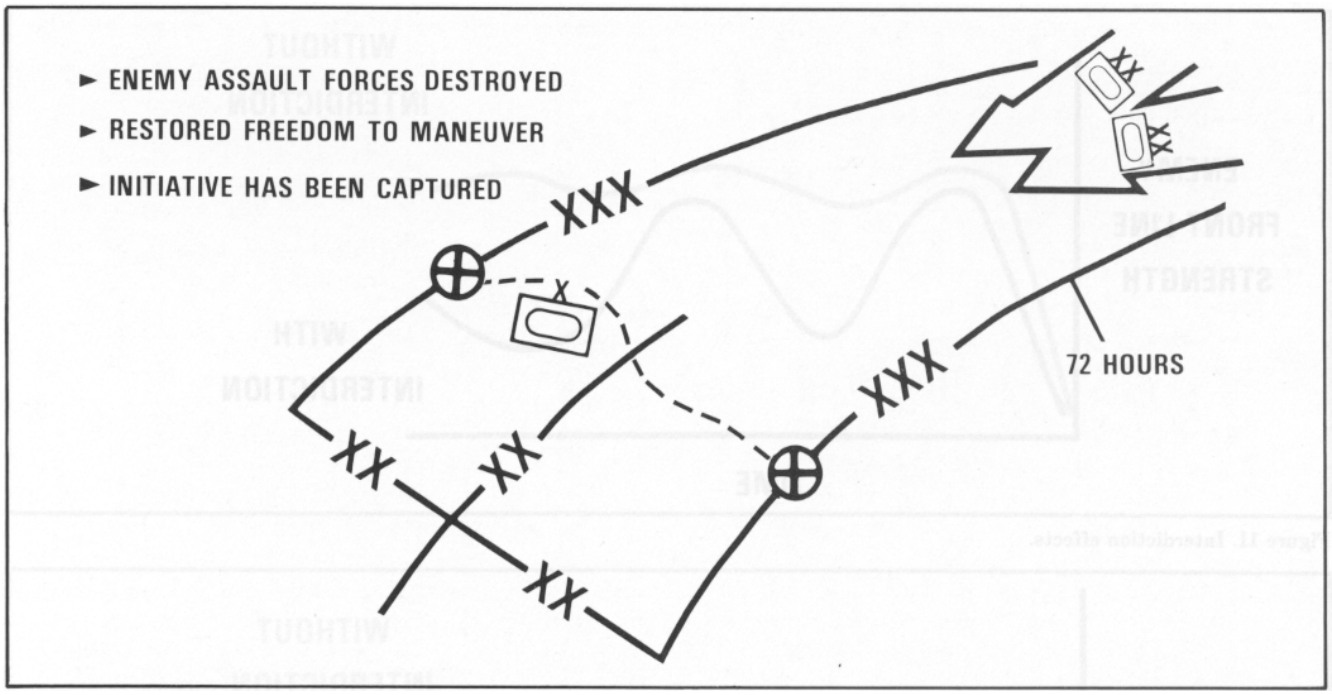


Figure 9. The outcome of the integrated battle.

help to defeat those in contact at the FLOT. Given the right target and assuming that the enemy has already used chemical weapons, it is here that our use of them can be integrated. They should be used to isolate one part of the battlefield while an attack is launched against another part of the follow-on forces. It is here that the land aspects of the battle predominate—that is, the battle is more land than air.

With a little luck, the outcome (figure 9) will find enemy assault forces destroyed, freedom to maneuver restored, and the initiative captured from the enemy. In the end, this simultaneous attacking of echelons becomes key to the primary objective of the extended battlefield—to win, not just to avert defeat.

Studies show clearly that successful interdiction does result in a degradation of the enemy's massive firepower. It is also clear that successful interdiction results in a reduction of enemy momentum brought on through loss of support and that it provides the defender time to secure nuclear release if required. Finally, interdiction reduces the attacker's alternatives by disrupting his ability to execute his intended plan.

The conviction that well-planned interdiction can provide these results is based in part on the target value analysis phase of a fire support mission area analysis completed by the US Army Field Artillery School. Part of that analysis was a simulation comparison of 1980 European corps battles, first without interdiction and then with interdiction.

- Enemy is able to mount fewer regimental attacks.
- Enemy first echelons defeated earlier.
- Friendly reserves not needed so early.
- Enemy penetrations far less extensive.

Figure 10. Effect of interdiction.

While the predicted availability of interdiction means may have been sanguine, some significant trends were, nonetheless, observed.

Each of the interdiction effects in figure 10 is highly desirable. But their exact significance is more apparent considering the simulation output over time. Specifically, a look at the effect of interdiction on enemy strength at the close-in battle shows the real value of deep attack.

The top curve in figure 11 shows that, without interdiction, the enemy is able to maintain consistent superiority at the FLOT over time. During this period, the defender's strength dwindles, freedom of action deteriorates, and the enemy's grip on the initiative decisively tightens.

What properly employed interdiction can provide is shown in the lower curve in figure 12. Here, enemy follow-on echelons are held out long enough to create periods of friendly superiority in which the initiative can be seized with enough time to act. The longer and more frequent these windows can be made, the greater the chance of winning, providing we are prepared to identify them and act at the time and in the place where they develop.

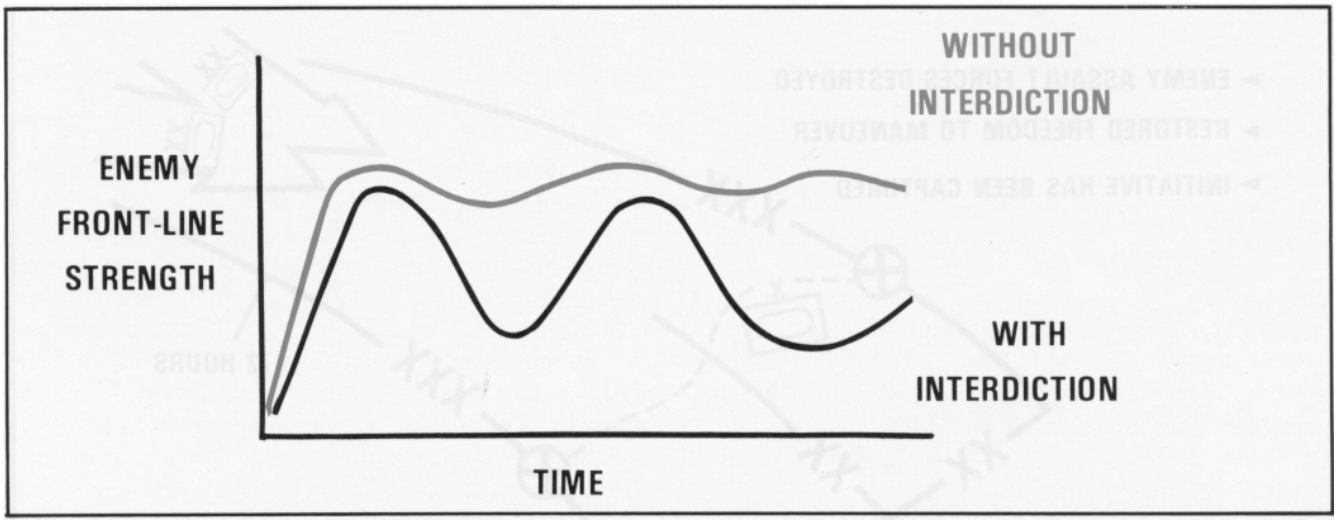


Figure 11. Interdiction effects.

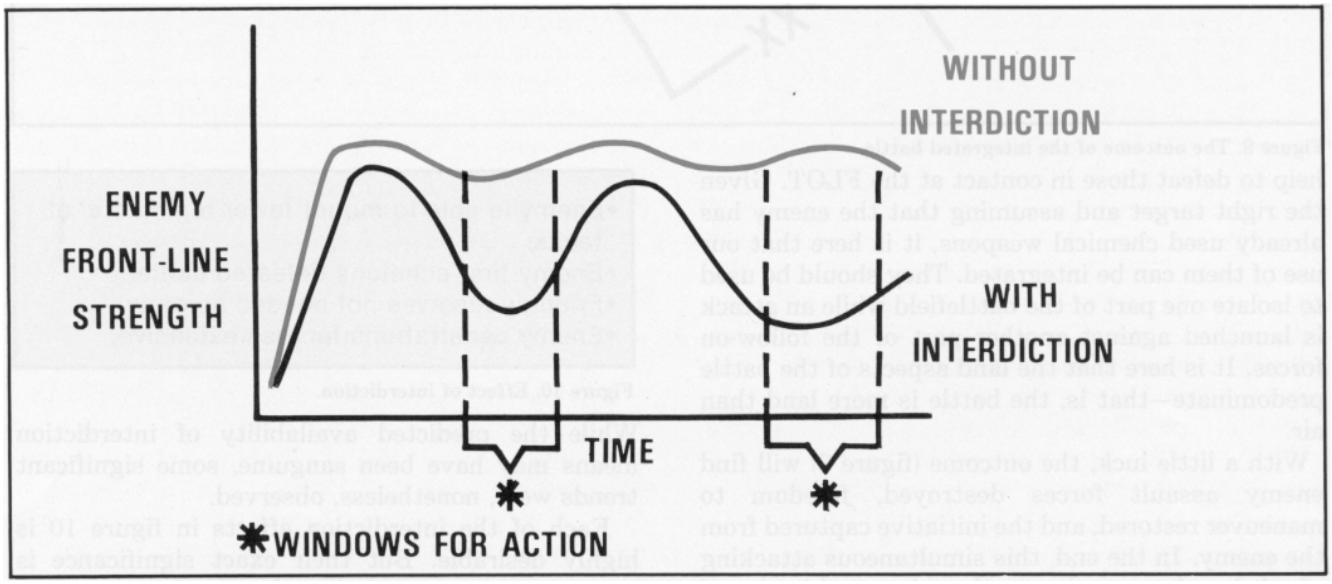


Figure 12. Properly employed interdiction.

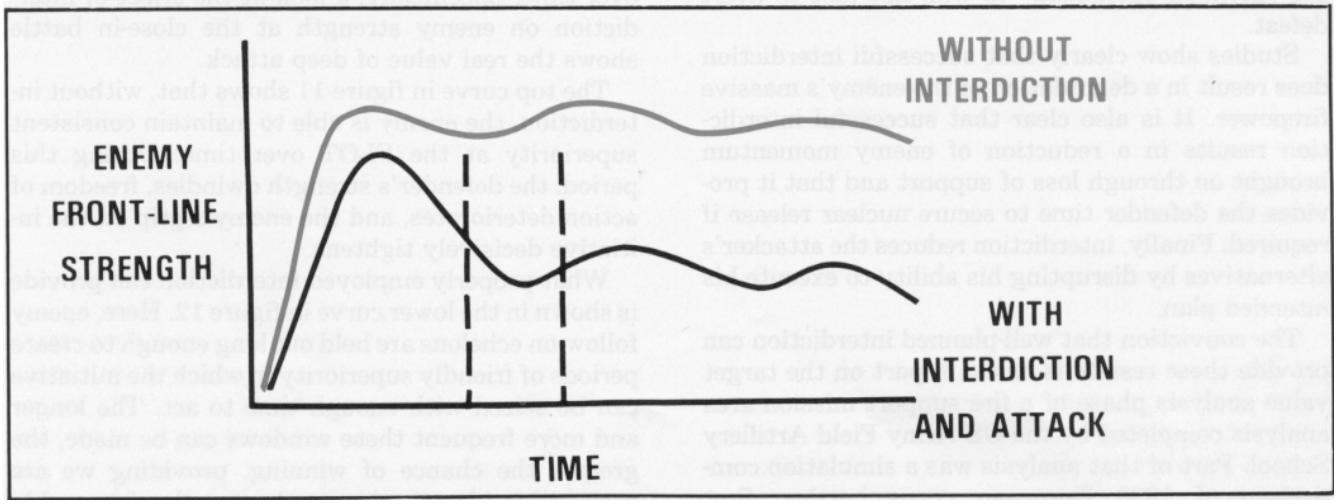


Figure 13. Interdiction and attack.

We may not be capable of creating windows of such frequency and duration across the entire corps front. However, it is now possible to create such opportunities, and, if aggressively exploited, they could lead to the generation of longer, more extensive opportunities for higher level decisive action building toward a major offensive (figure 13).

Interdiction planning

Summarizing, it can be seen that interdiction is key to battlefield success. The enemy's momentum can be altered by attacking high-value, second-echelon targets, reducing his ability to mass and build up momentum. Interdiction is the method whereby we achieve the leverage necessary to slow him down and ultimately stop him from achieving his objectives.

It is interdiction that allows us to focus our attacks on those enemy targets whose damage, destruction, or disruption would help us fight the battle to our advantage. Interdiction has as its main objective that portion of the enemy's force which is moving toward the FLOT or is in staging areas preparing to join that fight.

This interdiction concept does, however, imply some changes in current ways of thinking, especially in command control. In order to execute the concept, we must recognize the need to learn how to skillfully use resources far beyond those organic to corps and division and to plan their application over a greatly expanded battlefield. Of significance here is the establishment of timely and responsive working relationships with air forces for both target acquisition and attack.

The interdiction battle will be fought at the corps and division level. To do this well, it must be practiced routinely. Interdiction targets at division level are directly linked to tactical objectives. At corps, however, interdiction is a function of controlling target presentation rates and densities. As the enemy's second echelon moves closer to the FLOT, interdiction becomes more closely related to the defensive scheme of maneuver.

Advanced planning is absolutely critical to a successful interdiction battle. It is imperative that such planning be conducted continuously. This will insure that commanders are aware of courses of action open to the enemy and the vulnerabilities of each, thus enabling them to attack targets which present the highest payoff at a particular time. Prior to and during initial stages of the battle, the division intelligence officer, applying intelligence preparation of the battlefield techniques, must forecast enemy strength, progress, and dispositions at selected times. By assessing these developing vulnerabilities, he can recommend courses of action for interdiction attacks. When blended with the scheme of maneuver, these enemy vulnerabilities can then be exploited.

Following such an interdiction planning process, the intelligence officer can develop an enemy probable event sequence which can be used to predict with some high degree of accuracy which courses of action the enemy is likely to follow. That is, the intelligence officer should be able to forecast what events must occur and in what order to produce the desired disposition of enemy forces at any critical moment. This probable event sequence is simply a template against which to assess the progress of events. It identifies interdiction requirements which will have to be met if friendly commanders are to influence the battle in a desired direction.

Interdiction targeting can be a complex and demanding staff process, particularly at division level. Its effect is to create time and space gaps, not to relieve maneuver forces of having to face second-echelon elements. It is most effective when it is an integrated effort, one which effectively integrates fire support, electronic warfare, deception, and intelligence with maneuver.

Current and future capabilities

Having made a case for effective, continuous interdiction, what is the Army doing to achieve such a capability? Considering the weapons, sensors, and automation capabilities which will be available through Army 86 efforts, we will be able to do these things quickly and efficiently on the battlefield of the mid-to-late 1980s.

But what about now? The answer is that there is, today, considerable potential to do just what has thus far been described. Since the penalty in terms of battle outcome is too severe to wait to adopt the extended battlefield concept until 1986, our Army must set about seeing how we might get the most from current capabilities.

Even using conservative planning factors, interdiction of critical enemy second-echelon elements is possible within existing means. But, to make that a reality, we must begin transitioning to those concepts now and practice them daily. If we begin that transition with the resources at hand, we will thus be better prepared to fight and win while simultaneously maturing the conceptual notions in the day-to-day work of operational units. Such an approach will also insure that we have the right capabilities included in the Army 86 force designs.

And, so, as in all aspects of our profession, we must practice now what we intend to do in war. We must train as we will fight. Management of sensor assets in peacetime by those who will be expected to use them in war is the only prudent approach.

The same applies to the correlation of data in determining high-value targets. We must get the data into the hands of those who will be expected to use it in the future. We must establish integrated targeting cells in all fire support elements now. It is important that this capability be developed at corps and divisions for nuclear as well as for conventional and chemical targeting. It is important that it be done in all US Army units worldwide.

For the present, many of the acquisition means and most of the attacking means will come from air forces. This is particularly true for corps interdiction requirements. Regardless of who owns them, these are the means we need to gain the best battlefield return. Applying them according to the conceptual notions described above is the way to realize their greatest potential.

Recent exercises have demonstrated that the type of targeting information described earlier is available now—with current means. What next needs to be done is to design exercises for corps and divisions which will focus that information at their level. To make the interdiction battle occur properly and in a timely manner, corps and divisions must also be able to manage the current family of sensors.

We know the tendencies and patterns of threat units when they are deployed as they would be in a second-echelon formation. The task is to make this information available to corps and division commanders for their use in interdiction targeting.

For timely acquisition, we need to insure that corps has control of sensor systems such as the *OV1D* side-looking airborne radar, *Guardrail*, *Quicklook*, and the Integrated Test/Evaluation Program. Of equal importance is that there be a direct down-link of this information to divisions. Data from a number of other supporting means must also be made available. This category includes the *RF4C* and other national and theater systems. Among the most challenging problems is to create the downlinks necessary to pass what is already available to corps and divisions in a timely manner.

The Need for training target cells

To begin an adequate effort at fusing this data and developing interdiction targeting, cells must be established in all fire support elements at levels from brigade through echelons above corps. These cells must learn to exploit enemy vulnerabilities by blending the information and expertise available from all-source intelligence centers and electronic warfare support elements. Historically, we have focused all our training efforts on winning the fight in the main battle area. However, we are now entering a new dimension of battle which permits the simultaneous engagement of enemy forces throughout the corps and division area of influence. To accomplish this, we must emphasize training in four basic areas:

•Friendly acquisition capabilities.

•Threat tactical norms.

•Friendly attack systems.

•Specific techniques such as target value analysis and intelligence preparation of the battlefield.

For this to be totally successful, both Army and Air Force targeteers must be trained to work together in these functions. Microcomputers, which are currently available in an off-the-shelf configuration, can provide excellent assistance to this training effort. They can store a multitude of data from terrain features to fire plans, from friendly weapons systems to likely threat courses of actions. They can perform target analyses and display them in alphanumerics and graphics. If such systems were available in division targeting cells now and we created the necessary down-links for passing acquisition data, targeteers could train now at their wartime tasks in a realistic manner.

Figure 14 shows a notional division fire support element. The operations cell includes the target analysts. What needs to be done, and we have embarked on this course, is to establish the targeting cell and staff it with people who are currently performing similar tasks elsewhere. We must bring the operations types and the targeting types together.

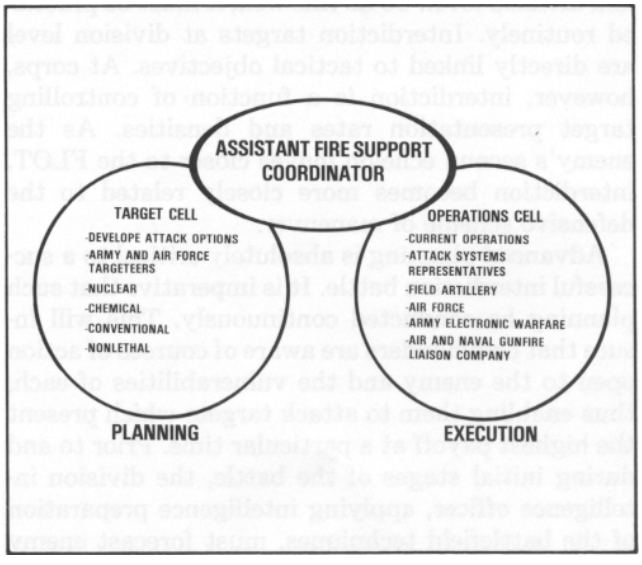


Figure 14. Notional fire support element.

For such a fire support element to be effective, its personnel must train together daily, as a team, using real-time or near-real-time data supplied by an integrated sensor network such as that described earlier. If actual real-time data is not available, then simulated acquisition information could be used, so long as the data base was developed from previously collected actual information.

Through continuous intelligence preparation of the battlefield, a clearer analysis of the area of operations can be developed, one which will facilitate updating interdiction plans and thereby better support operations plans. Such a training activity would contribute greatly to developing confidence and proficiency. By exchanging views and working together, Army and Air Force target cell personnel could establish a credible capability now to deal with any future second-echelon threat.

Remaining challenges

Like most things of great worth, this capability will not be easily gained. There are many challenges, but, in the end, it will be worth all the effort necessary to make it happen. Foremost among the challenges are those which inhibit our ability to blend current operational requirements of sensor means with the need to conduct real-time training at divisions and corps. It will also be difficult, though essential, that appropriate security clearances be acquired for all personnel working in the target cells. This is especially important, for they must have access in peacetime to the data they will be expected to process in war.

Recognizing it is beyond our capability to conduct actual exercises which simulate threat second-echelon patterns so target cells will have something to train against, it is within the state of the art for computer simulations to postulate and portray scenarios which the enemy traditionally follows because they are based on his known tendencies. This would be a useful substitute for targeteers to practice such analytical tasks as event sequencing. Lastly, we must continue to upgrade our communication capability and take advantage of existing commercial facilities. If we do all this, the payoff will be more than worth the investment.

Summary

The challenges notwithstanding, the message of all this is quite clear:

•Attacking deep is essential to winning.

•Attacking deep and the close-in fight are inseparable.

•The extended battlefield concept is the keystone of force modernization.

•We can begin today to practice, learn, and refine the extended battlefield concept.

The ideas of the extended battlefield concept are, in fact, the very same ideas upon which the Army 86 concepts are based—see and attack deep. And, as might be expected, therefore, organizations of Division and Corps 86 correspond in makeup and function to elements of the extended battlefield team.

The question before the Army now is how to implement the concept quickly. While there are yet some questions, it is not likely that man-years of study will clear them up to the satisfaction of all concerned. It is, therefore, time to field and learn to use the concept on the ground with real troops, real equipment, and real-world problems of field commanders.

The time for implementation is now. This is so because there is, first of all, promise of a major increase in combat effectiveness with current means. There also exists an enhanced capability to exploit new sensors, weapons, and command control systems as they are fielded. This enhanced capability is even more evident in the field of microprocessors and computers. As a nation, we have a considerable advantage over our potential adversaries in this technological field. If we strive to put that advantage to work for us, it could become a significant combat multiplier. And, finally, of equal importance, there is an opportunity to cause the enemy to wrestle right now with a problem he has traditionally assumed does not exist.

Army leadership is so convinced that a real potential exists now, if current assets are organized correctly, that a four-phase program has been developed. Phase one, already begun, includes conferences at each major command designed to lay down the basic ideas. This article is part of that phase. In phase two, the US Army Training and Doctrine Command and the major Army commands will jointly refine implementation proposals to fit specific priorities and assets.

In phase three, the joint product will be provided to corps and divisions in the field. In phase four, Army service schools and centers will conduct training in the concept and implementing procedures to insure that officers and noncommissioned officers leaving the training base are ready for their respective roles on the extended battlefield.

GEN Donn A. Starry is Commanding General of the US Readiness Command, MacDill Air Force Base, FL.

Implementing the AIRLAND BATTLE

The Army stands at the threshold of one of its greatest periods of change as it prepares to implement organizational and doctrinal changes which will greatly increase the probability of winning the next war, not just the first battle.

Emerging tactical doctrine will be based on the AirLand Battle concept. This concept incorporates the concepts of the extended battle and fighting on a totally integrated nuclear, chemical, conventional, and electronic battlefield. General Starry's article provides an excellent vehicle for readers to become acquainted with this concept, as he discusses fighting the extended battle with all types of weapons and underscores the necessity for fighting the AirLand Battle. (For those desiring additional information on the AirLand Battle, TRADOC Pamphlet 525-5, "The AirLand Battle and Corps 86," dated 25 March 1981, is the official, published reference.)

On the integrated side of the AirLand Battle, the United States Field Artillery and Air Force both have nuclear and chemical capabilities. In the past, however, the Army has not adequately planned for the use of nuclear and chemical munitions

in all of our targeting. The AirLand Battle requires targeting the enemy with both conventional and nuclear/chemical munitions to allow the maneuver commander to have the targeting completed and the request for release submitted well ahead of the need to employ the weapons. As General Starry states in his article, it is desirable to attack the enemy with nuclear weapons when he is well within his own territory. As the enemy force approaches the forward line of own troops (FLOT), there is an increased risk of creating hazards to our own troops and the potential targets are usually better protected (e.g., armored) than those back in the deep area.

The AirLand Battle presents many challenges for both the fire supporter and the maneuver commander. The purpose of this article, therefore, is to articulate how the Field Artillery is responding to these challenges.

The mission of the Field Artillery remains unchanged in the AirLand Battle—to destroy, neutralize, and suppress the enemy with cannon, rocket, and missile fires and to assist in the integration of fire support in the scheme of maneuver. That mission, however, has become more complex in terms of execution due to the increase in requirements.

Fire Support Mission Area Analysis

To get an idea of how adequately the fire support system and the Field Artillery in particular was prepared to cope with the demands of a Warsaw Pact threat, Fort Sill recently conducted and completed the Fire Support Mission Area Analysis (FSMAA). The FSMAA, which represents the most detailed look ever taken at the ability of the fire support system to accomplish its mission, revealed a list of deficiencies which needed correction for us to succeed on the AirLand Battlefield. Those deficiencies were prioritized and a Fire Support Development Plan was prepared which contains specific actions and milestones to resolve these deficiencies. In addition, the FSMAA analytical work provided insights of how the three fire support battle tasks (close support, counterfire, and interdiction) affect the frontline battle.

Simulated battle

Although General Starry's article has addressed the impact of interdiction attacks on the presentation of enemy units into the close-in battle, computer simulation demonstrated how the interdiction efforts affected the movement of the frontlines. During a force-on-force analysis, a portion of the V Corps sector of the Federal Republic of Germany was depicted. The V Corps was fighting a Combined Arms Army of the Warsaw Pact with current organizations and equipment.

In case 1, all fire support assets were used to support the close-in battle and there was no interdiction effort. Figure 1 shows the movement of the forward line of own troops over a five-day period of the simulated battle. The familiar towns of Fulda (FA), Alsfeld (A), Schluctern (S), Budingen (B), and Schlitz (SZ), are indicated by capital letters and the direction north is at the top of the figure. The FLOT by Day 5 was more than 70 kilometers west of the initial FLOT, and there had been a major enemy penetration of the defense.

Figure 2 (case 2) shows the same battle, but this time a portion of the fire support assets were diverted to interdict the second echelon regiments and divisions before they could close, and the results were drastically different. With interdiction, there was still a penetration, but it was much less extensive than in the case without interdiction. By reducing the enemy's forward momentum and commitment flexibility, interdiction gives the friendly force commander the opportunity to maneuver. It is this effect which is the goal of interdiction; that is, to create the opportunity for the supported maneuver commander to seize the initiative.

Through the FSMAA we also found that counterfire directly affected the immediate frontline battle. Over the years there has been a tendency for many professional soldiers to think of counterfire as an artillery duel which had little impact on the frontline. Analysis, however, clearly demonstrated the impact of counterfire. Figure 3 shows a comparison of Infantry Fighting Vehicle (IFV) exchange ratios over a five-day battle with and without counterfire. The ratios improved markedly when counterfire was used, which is attributed to the effect counterfire had on reducing the enemy's capability to suppress our direct fire systems, allowing more direct fire engagements in the close-in battle.

Close support remains an important role. Even though our adversary has made significant progress in hardening the vehicles in his lead formations, artillery and other fire support assets can provide assistance by separating infantry from tanks, obscuring tanks in overwatch positions, and attacking individual hard targets, such as tanks, with the soon-to-be-fielded Copperhead, 155-mm, laser-guided projectile.

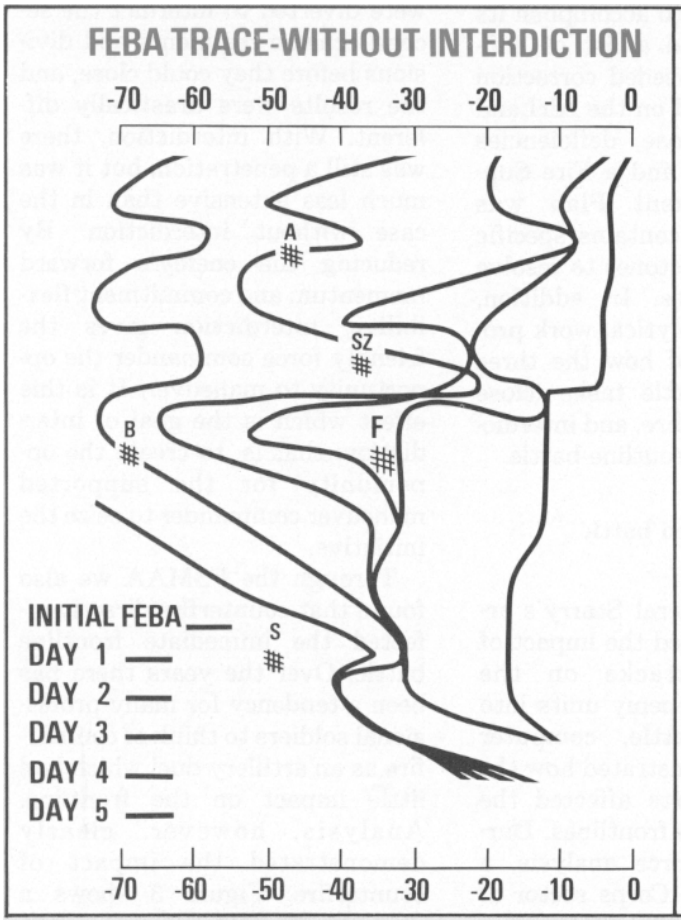


Figure 1. Case 1 (computer simulation).

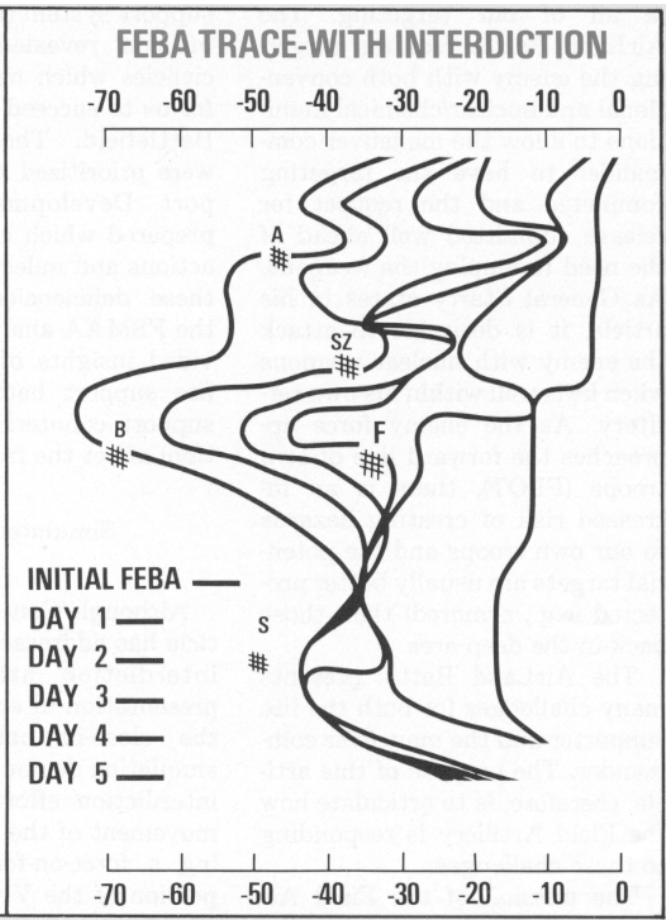


Figure 2. Case 2 (computer simulation).

Allocation

All three roles—close support, counterfire, and interdiction — have a legitimate claim on the fire support assets available. The result is a major problem for the supported maneuver commander in determining how to allocate his resources among the different missions. It would be nice if there were a formula available which could be used to determine the optimum allocation. Unfortunately there is not. Until such a formula is developed, it is imperative that there be flexibility in the allocation of fire support resources.

At corps level, it is doubtful that any cannon system will be able to range the anticipated corps interdiction targets. There will be a heavy reliance on air support and the Lance missile system. The corps commander must then retain sufficient attack resources to accomplish his interdiction tasks and then allocate the remaining resources to the subordinate divisions, based on the overall corps plan.

At division level, the allocation problem is most acute since the division is expected to perform all *three* fire support roles, while the corps is interested *primarily in interdiction.* The division commander will have organic, reinforcing, or attached field artillery

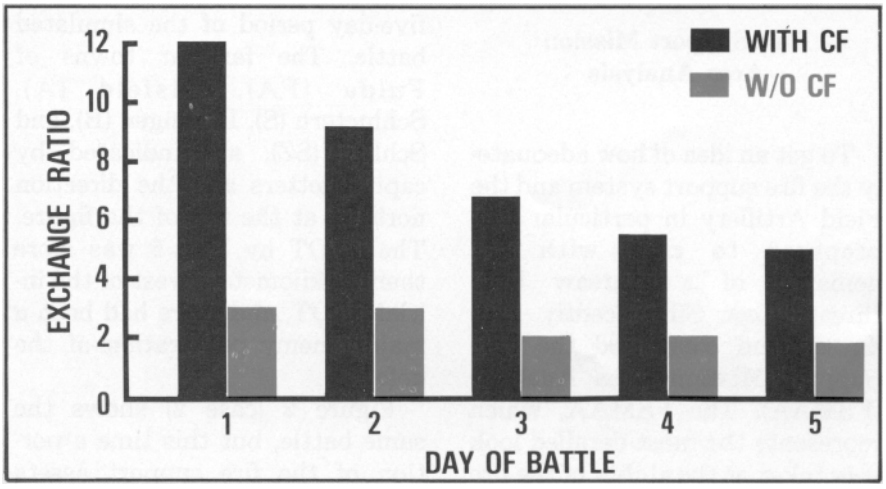


Figure 3. Cumulative exchange ratio of Infantry Fighting Vehicles (red/blue) with counterfire vs without counterfire.

cannon units and possibly missile units and whatever air sorties the corps commander has distributed to him. It will be necessary for him to support his maneuver brigades in the close-in battle, insure that enemy artillery suppresses neither his maneuver nor his fire support assets, and simultaneously strike deep targets to influence the developing battle.

At the heart of the problem are the issues of unit positioning and priorities of fire. *Positioning* is critical because targets of primary interest to the division, counterfire and interdiction, will frequently be at the outer limit of cannon ranges and because division frontages have grown so wide that it is no longer possible to shift coverage among brigade sectors simply by traversing the tubes of the howitzers. *Priorities* are critical because they determine the order in which requests for fire are honored, thus the promptness with which fires are delivered.

Under current field artillery doctrine, both positioning authority and priorities of fire are largely determined by the tactical mission assigned a given artillery battalion. While we can rapidly change the tactical mission assigned to a given battalion, the depth and coverage limitations mean that there is no guarantee there will be an immediate shift in target coverage. For example, changing a battalion's mission from reinforcing to general support reinforcing to meet a momentary tactical requirement may give the division *first priority* on its fires, but there is no assurance that the battalion will be in a position to deliver those fires. Moreover, standard tactical missions carry with them other responsibilities (e.g., communication and liaison) which are awkward to change rapidly.

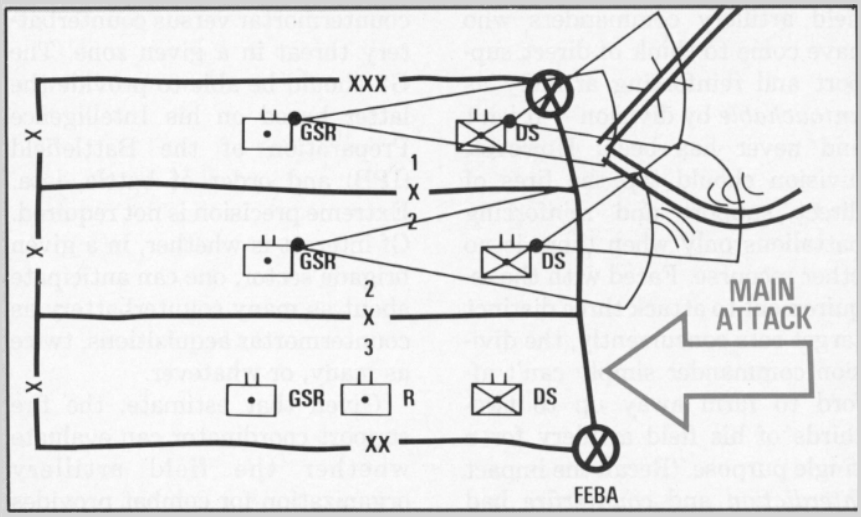


Figure 4. Fundamentals for organizing field artillery for combat.

Accordingly, until some clear guidelines for distributing fires among major tasks are developed, the fire support coordinator must at least attempt to insure that the field artillery organization for combat is sufficiently balanced to allow division requirements to be met without significant loss of support to the committed maneuver brigades. The following procedure will assist in accomplishing this.

First, the artillery is organized for combat using the five fundamentals contained in FM 6-20, "Fire Support in Combined Arms Operations," as shown in figure 4.

1. Maximum feasible centralized control.
2. Adequate support for committed units.
3. Weight main attack/vulnerable areas.
4. Facilitate future operations.
5. Immediately available artillery with which force commander may influence action.

Figure 5. Allocation.

Next, critical division interdiction requirements are determined. Procedures for doing this are discussed in General Starry's article and will be contained in the revised FM 6-20. The thrust of this step is to modify the initial organization for combat, if necessary, to assure responsive coverage of interdiction targets which are to be attacked by field artillery assets. Figure 5 depicts a hypothetical situation where a division is defending with three brigades on line. The initial organization for combat tactical missions are shown to the right of each unit symbol. The bridge and defile shown in enemy territory have been identified as key interdiction targets. When range fans are drawn, it becomes apparent that only the direct support battalions in the 1st and 2d Brigades can attack the targets, which are scheduled to be attacked at approximately H+6. Accordingly, the missions of those two battalions may be modified by requiring each to place the fires of one battery *on call* to the division from H+4 to H+7. During that period, each of the brigade's priority fires would be reduced by one, and the batteries which are committed to the division mission could not reposition without approval from the division artillery. Apart from these limitations, however, the brigades would retain full use of each battery's fires.

This procedure may seem radical to many maneuver and

field artillery commanders who have come to think of direct support and reinforcing artillery as *untouchable* by division — it isn't and never has been. However, division should tap the fires of direct support and reinforcing battalions only when there is no other recourse. Faced with the requirement to attack three distinct target sets concurrently, the division commander simply can't afford to farm away up to two-thirds of his field artillery for a single purpose. (Recall the impact *interdiction* and *counterfire* had on the immediate battle as shown in figures 2 and 3.)

The next step in this allocation process is to examine the organization for combat with respect to the predicted *counterfire* requirements. In the *counterfire* role we can look at a certain natural division of labor between the direct support and reinforcing battalions (which respond first to brigade requirements) and the general support and general support reinforcing units (which respond first to the force as a whole). Generally, enemy mortars and accompanying artillery will be detected and attacked first by artillery supporting the brigade. The AN/MPQ-4 radar today and the new AN/TPQ-36 countermortar radar, when fielded, will be directly linked to a direct support artillery battalion. In contrast, deeper indirect fire systems, those which the AN/TPQ-37 counterbattery radar is designed to locate, will be targeted by division artillery's targeting element and typically attacked with general support units.

To complete the allocation process, it is necessary to assess the ratio of direct support and reinforcing artillery to general support and general support reinforcing artillery in each brigade zone. This ratio should correspond roughly with the expected countermortar versus counterbattery threat in a given zone. The G2 should be able to provide the latter based on his Intelligence Preparation of the Battlefield (IPB) and order of battle data. Extreme precision is not required. Of interest is whether, in a given brigade sector, one can anticipate about as many counterbattery as countermortar acquisitions, twice as many, or whatever.

Given that estimate, the fire support coordinator can evaluate whether the field artillery organization for combat provides an appropriate balance of division versus brigade priority in each sector. Looking at figure 5, we find the acquisitions to be about equal in the 1st and 2d Brigade sectors, but the G2 reports there should be about twice as many counterbattery as countermortar acquisitions in the 3d Brigade sector. This could be expected since the enemy will attempt to weight his main effort with artillery. Consequently, the fire support coordinator recommends that the mission of the reinforcing battalion in that sector be changed to general support reinforcing. This step completes the process. All that was done was to fine tune, as much as possible, the original organization for combat to meet the anticipated requirements of the force as a whole without severely penalizing the committed brigades.

Relative target value

In addition to the allocation dilemma of the maneuver commander, the AirLand Battle will create the need for more efficient targeting than has traditionally been accomplished. Given limited attack assets and a multitude of targets—ever increasing with the introduction of newer, more sophisticated target acquisition systems, such as the Firefinder radars and the Standoff Target Acquisition System (SOTAS) — the fire support system can no longer afford to treat every target as important. What is needed is a system to evaluate targets based on their relative worth to the tactical outcome of the battle.

Fortunately, the FSMAA had, as an integral part, a methodology called the Target Value Analysis (TVA) which links weapons effects to target behavior. The TVA suggests the relative utility of attacking various targets engaged in specific tactical operations.

An output of the TVA was the production of 17 "spread sheets," a simplified example of which is shown in figure 6. Each sheet applies

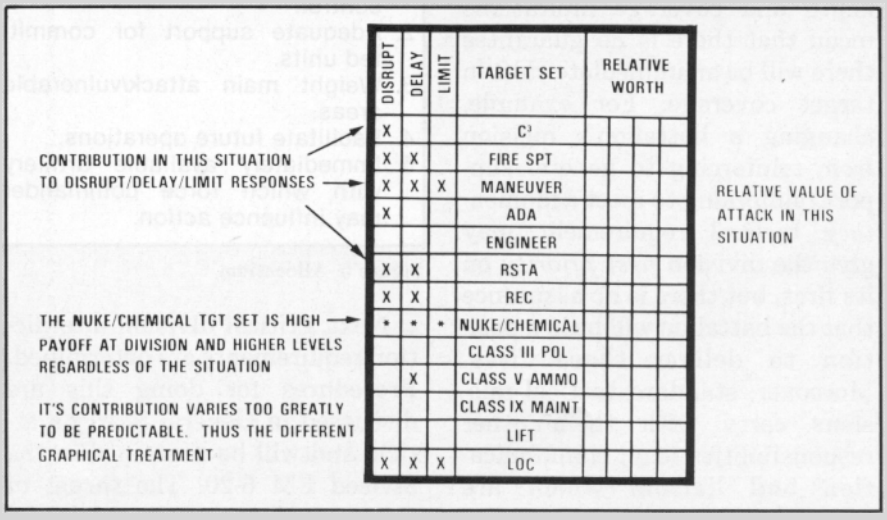


Figure 6. FSMAA spread sheet.

to a specific enemy echelon of command, regiment through front, engaged in a specific tactical operation; e.g., a hasty river crossing or a movement to contact. The spread sheet groups potential targets into 13 target sets as shown in the center column. In the first three columns, potential target sets are identified, the attack of which would contribute to achieving a particular response or objective — disrupt, delay, or limit. The relative tactical utility of such an attack is recorded in one of the columns on the right. Nuclear and chemical targets are always high payoff targets when located and attacked, thus the different treatment. Included with each actual spread sheet is a time-sequenced list of recommended target attack objectives, expected enemy responses, and a set of associated target sheets which give detailed descriptions, signatures, and other needed information on the targets themselves.

These spread sheets can be used at several key points in the battle management process. The division fire support element can use them in conjunction with the G3's course of action analysis to plan support of future operations. The G2 and S2 can use them to focus intelligence, surveillance, and target acquisition assets. Additionally, fire control officers at every level, from battalion through corps, can use them to distribute and shift fires among multiple competing targets.

Complete sets of the spread sheets, along with detailed instructions for their use, have been distributed to all Active and Reserve Component divisions. They should serve as a base for development of additional sheets adapted to a particular unit's area of operation, contingency mission, or adversary, if different from the ones used in the TVA.

AirLand Battle Planning

The extended battle will require more detailed and farsighted planning than that accomplished by most battle staffs in the past. The ideas supporting the extended battle are not new, but existing organizations have not been configured to provide a facility for planning the extended portion of the AirLand Battle nor to exploit the TVA methodology just discussed. The Army 86 organizational changes will remedy this shortcoming, but it is imperative that work begin today to develop the staff interfaces and procedures required to succeed.

The focal point for AirLand Battle planning will be the main command post. Only the main command post has the intelligence, maneuver planning, and fire support planning resources to adequately develop plans and orders in the detail required by the AirLand Battle. Within the command post, the three key participants in AirLand Battle planning are the G3 Plans, the All Source Intelligence Center (ASIC), and the fire support element (FSE).

G3 Plans

The G3 Plans section is charged with the responsibility of translating the commander's guidance into detailed operations plans and orders assigning specific tasks to subordinate elements of the command as well as articulating the mission of the force. The AirLand Battle requires the G3 Plans section to look much deeper onto the battlefield than traditionally has been done. Enemy forces and facilities which represent the greatest threat to the scheme of maneuver must be identified early, and decisions made on how those forces and facilities must be affected to make the commander's tactical plan succeed. These decisions then become interdiction requirements. A typical interdiction requirement might be, "Delay the northernmost second echelon motorized rifle regiment east of gridline ND98 until H+4."

To provide the personnel and expertise to visualize the extended portion of the battle, there may be a requirement to provide additional personnel to the G3 Plans section. The Combined Arms Center, Fort Leavenworth, has recommended formation in G3 Plans of an element which develops specific interdiction requirements. This cell would use the current enemy and friendly situations and the course of action being evaluated to determine interdiction requirements. Requirements would then be evaluated to determine where deep maneuver could be used to maximum advantage and where opportunities for deception and psychological operations exist. The remaining interdiction requirements and fire support requirements to support deep maneuver are passed to the fire support element for detailed analysis. Once the fire support analysis has been completed, the G3 Plans section integrates the maneuver and fire support plans into a cohesive force operations plan.

ASIC

The conduct of interdiction planning to support the AirLand Battle requires detailed focusing of target acquisition resources and the timely dissemination of information once obtained. As the manager of the force's intelligence-gathering resources and the force's link to the resources of

higher headquarters, the ASIC is a crucial component of the planning process. Prior to the commencement of hostilities, the ASIC conducts Intelligence Preparation of the Battlefield (IPB). IPB includes detailed analysis of terrain, weather and enemy dispositions. IPB information is used by the G3 Plans section and the FSE to identify terrain-oriented targets, e.g., bridges and defiles, which can be targeted before hostilities commence.

Intelligence gathering is critical to success on the AirLand Battlefield. Before any deep attack can begin, the enemy force must be acquired (e.g., detected, identified, and located with sufficient accuracy for attack), and after the attack there must be an assessment made to determine the success of the attack. The ASIC determines the feasibility of target acuisition and assessment to support the planning conducted by the G3 Plans and the FSE. Without assurance that acquisition and assessment is feasible, interdiction planning is fruitless.

Acquisition of high payoff targets is another important function of the ASIC. High payoff targets are those whose loss by the enemy can be expected to contribute to substantial degradation of an important battlefield function. The FSE provides the ASIC with information on target signatures and possible locations based on TVA methodology just discussed. The ASIC used that information to focus acquisition resources and to insure the timely dissemination of target locations once determined.

FSE

Once interdiction requirements have been developed by the G3 Plans section and passed to the FSE, those requirements must be translated into specific target attack tasks. The current FSE must be expanded to provide personnel and equipment to conduct the detailed targeting required for this translation. This expansion results in an FSE composed of a planning branch and an operations branch. The functions of the planning branch are:

•Develop the detailed fire support attack options to perform interdiction requirements passed by the G3.

•Specify high payoff targets for acquisition and attack.

•Coordinate atttack of targets and attack strategy with higher, lower and adjacent units.

Within the FSE, the planning branch works closely with the operations branch to insure that attack options are feasible in terms of system availability and capabilities. The planning branch develops options for attack of targets to include electronic warfare, and provides the G3, through the fire support coordinator (FSCOORD), a list of options and the estimated cost in terms of weapons, munitions, and target acquisition and assessment assets (based on interface with the ASIC). This information is vital to competent decision making since each asset used in the interdiction effort is not available to support the battle near the forward line of own troops (FLOT). Once the maneuver commander has approved the plan, the planning branch within the FSE monitors fire support's execution of the plan.

Similarly, when high payoff targets are located, the planning branch determines attack options and passes complete targeting and attack information to the operations branch if the maneuver commandr's guidance permits. When restrictions exist in the attack of high payoff targets, the information is passed to the G3 for a decision on whether or not to attack.

The bottom line of AirLand Battle planning is the need to establish the necessary staff interfaces between G3, ASIC and FSE and exercise them as much as possible. Figure 7 depicts the flow of information.

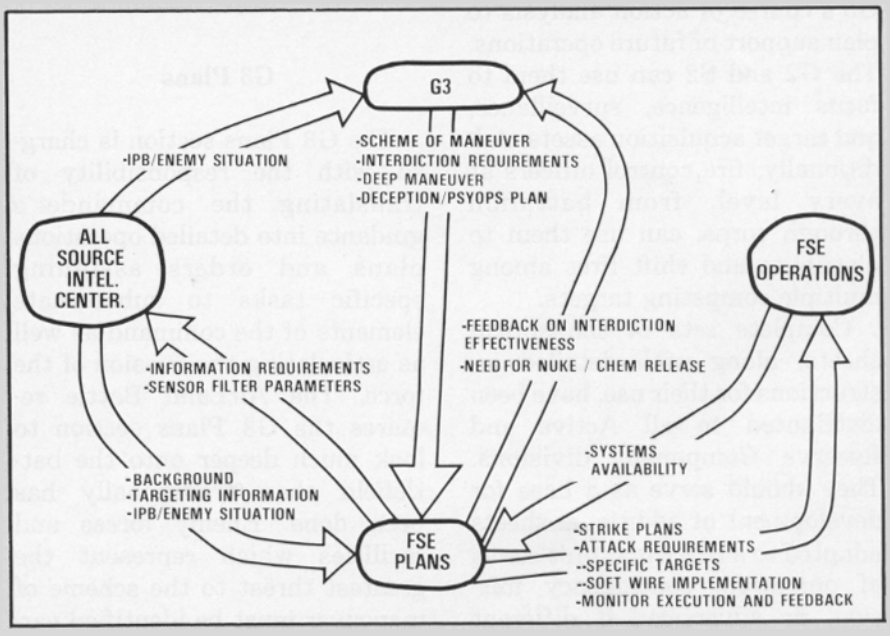


Figure 7. AirLand planning interfaces.

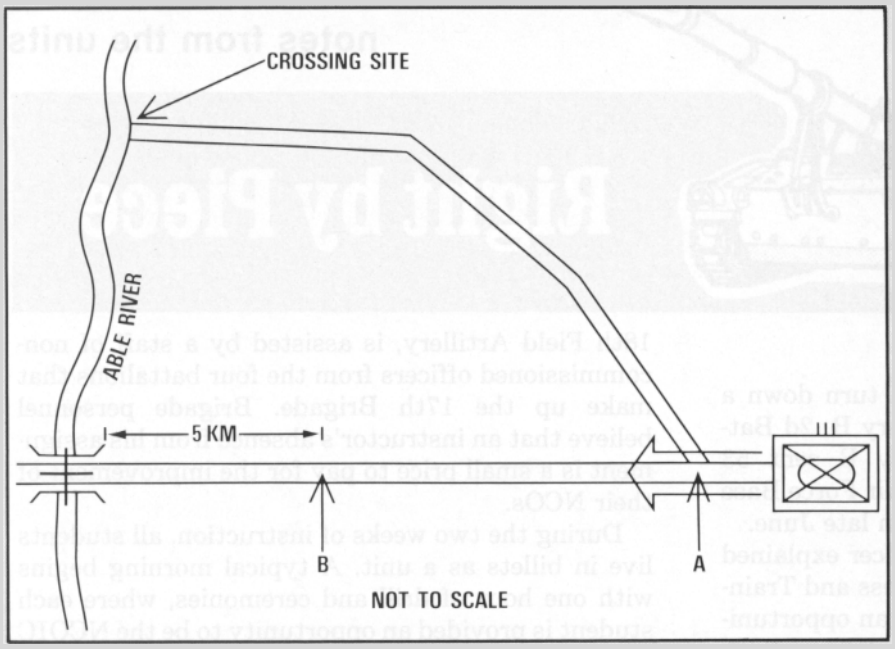


Figure 8. Sketch map.

Timing

A critical component of any plan is the timing of specific actions. When an interdiction plan is developed, times of attack and acquisition and assessment must be tentative, depending on the movements of the enemy forces. For example, figure 8 depicts an enemy force approaching a bridge which has been targeted. If the bridge is destroyed before the enemy force reaches point A, the commander can divert to an alternate route with minimal delay. Therefore, it is important not to attack that enemy force until after it has passed point A and is committed to the route over the bridge. Point B denotes the place the enemy force must not pass if the bridge is to be destroyed prior to the force crossing. This point is selected based on the time it takes to transmit the information from the ASIC to the FSE that the enemy force has been detected, the time it takes for the attack once this information is received, and estimated enemy movement rate. Therefore, target acquisition assets must be focused between points A and B. The ASIC will inform the FSE of the feasibility of acquiring targets in that area. With existing moving target indicator radar acquisition devices, parts of the battlefield may be screened from observation by hill masses; in this case, if the target is of sufficient importance, the G3 may designate that long range patrols be used to provide the necessary acquisition.

Once the attack has been initiated, the effect of the attack must be assessed. This assessment is not to determine the number of vehicles destroyed, but rather to determine what the enemy force is doing. For example, approximately 20 minutes after the strike, it may be necessary to look at the target area to ascertain whether or not the enemy force is moving again. If the force is moving in the direction of the FLOT prior to the required delay, the FSE must initiate additional attacks, to gain additional delay. Each target to be attacked must be planned in terms of acquiring, processing the information, attacking it, and assessing the effects of the attack. Failure to do any one of these tasks will cause or significantly increase the risk of mission failure.

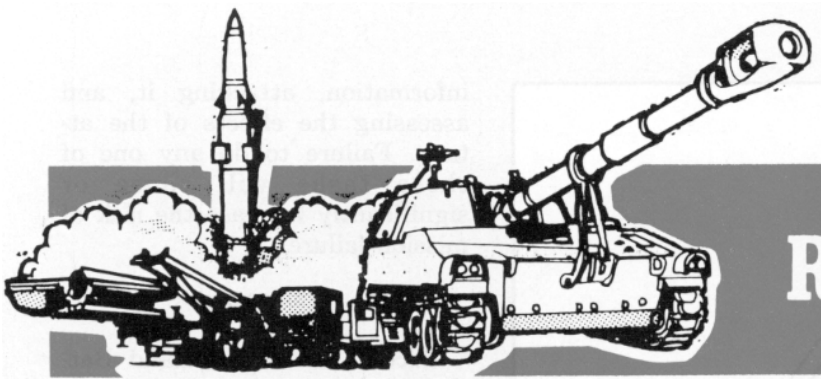
Summary

Success on the AirLand Battlefield requires that all members of the combined arms team begin training now and develop procedures which facilitate planning and execution.

From the fire support perspective, there must be an increase in our working relationship with maneuver commanders and our Air Force counterparts. Command post exercises must be conducted on a frequent basis to train personnel on the interfaces just discussed. If a targeting cell has not yet been formed, the G3 and FSE should initiate action to begin developing targets (probably terrain-oriented) based on the Intelligence Preparation of the Battlefield conducted by the G2. The air liaison officers must assist in the development of attack options, particularly in the use of Air Force offensive electronic warfare assets and acquisition systems. There must be exercise of the planning and communications channels between higher, lower, and adjacent units in the dissemination of target planning data and intelligence.

The Field Artillery School is actively working on refining procedures and doctrine to support the AirLand Battle and welcomes any thoughts on how to best accomplish our mission. Ideas and comments may be submitted to:

Commandant
US Army Field Artillery School
ATTN: ATSF-CA-D
Fort Sill, OK 73503



Right by Piece

Florida training

FORT BENNING, GA—Who would turn down a free round trip to Florida? Not Battery B, 2d Battalion, 10th Field Artillery. Battery B sent 53 soldiers and four howitzers to Eglin Air Force Base for a force-on-force training exercise in late June.

MAJ Loren E. Hood, executive officer explained that this mini-ARTEP (Army Readiness and Training Evaluation Program) offers quite an opportunity for the artillerymen to practice loading and offloading their howitzers.

"Rock Support" soldiers were armed with rifles and fired blank rounds to defend themselves and their perimeter. The force-on-force exercise put 41 aggressor soldiers from Company C, 3d Battalion, 7th Infantry, against the "Rock Support." Multiple Integrated Laser Engagement System (MILES) was used during the battle.

With MILES, the troops were able to tell whether or not they had been "killed" or wounded by the enemy. "I kept low so I didn't get hit," said CPL Richard Matuszczak of Battery B.

"I had the same training overseas a few times," said Matuszczak, "and it was more realistic there because the enemy was just across the border. Here it seems more like a game, but the training was still very good. Also, going to another state made the training more realistic."

17th FA Brigade leadership school

AUGSBURG, GERMANY—The 17th Field Artillery Brigade, commanded by COL Andrew J. McVeigh III, has developed a "Leadership School" for assigned soldiers in the grade of E5. The School is not intended as a replacement nor a substitute for PNOC, BNOC, and/or PLC, but as an augmentation to develop leadership traits in young noncommissioned officers. Candidates are selected for school attendance from an order of merit listing developed in their battery of assignment. Each class is in session for two weeks, and virtually every battery within the brigade is represented.

CSM Michael Hutchins, the School Commandant, and Command Sergeant Major of the 1st Battalion, 18th Field Artillery, is assisted by a staff of noncommissioned officers from the four battalions that make up the 17th Brigade. Brigade personnel believe that an instructor's absence from his assignment is a small price to pay for the improvement of their NCOs.

During the two weeks of instruction, all students live in billets as a unit. A typical morning begins with one hour of drill and ceremonies, where each student is provided an opportunity to be the NCOIC of the formation. Classes on leadership, counseling, map reading, method of instruction, human relations/equal opportunity, and military appearance fill the duty day, which ends at 1600 hours with physical training. During the PT instruction, each student performs as the instructor for an exercise. The detachment then goes on a three-mile run and, after an open hour for the evening meal, another formation is held. All personnel with an academic average below 85 percent are retained for a mandatory study hall. Late in the evening, the whole student detachment again meets for cleaning of common areas.

On Saturday morning, there is a Commandant's Inspection of personal gear and uniforms. The winner of this award is singled out during the commencement ceremony the following Friday, along with the distinguished and honor graduates.

The 17th FA Brigade heartily recommends that other brigade-size units start their own "Leadership School."

Corrections

On page 47 of the May-June 1981 *Journal*, the caption under the photo in the right column states that the M198 weighs only 4,850 pounds. Actually, the M198 weights *15,500 pounds*.

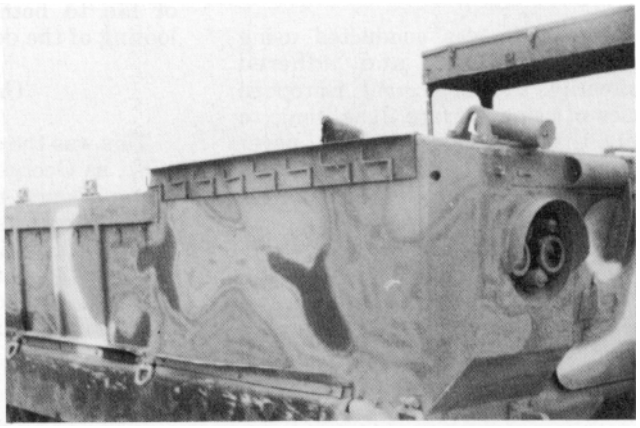
On page 26 of the July-August 1981 *Journal* (under "Big Guns"), it was stated that the M198 howitzers could fire the "rocket-assisted" Copperhead. The Copperhead is *not* rocket-assisted.

Weapon and equipment bracket

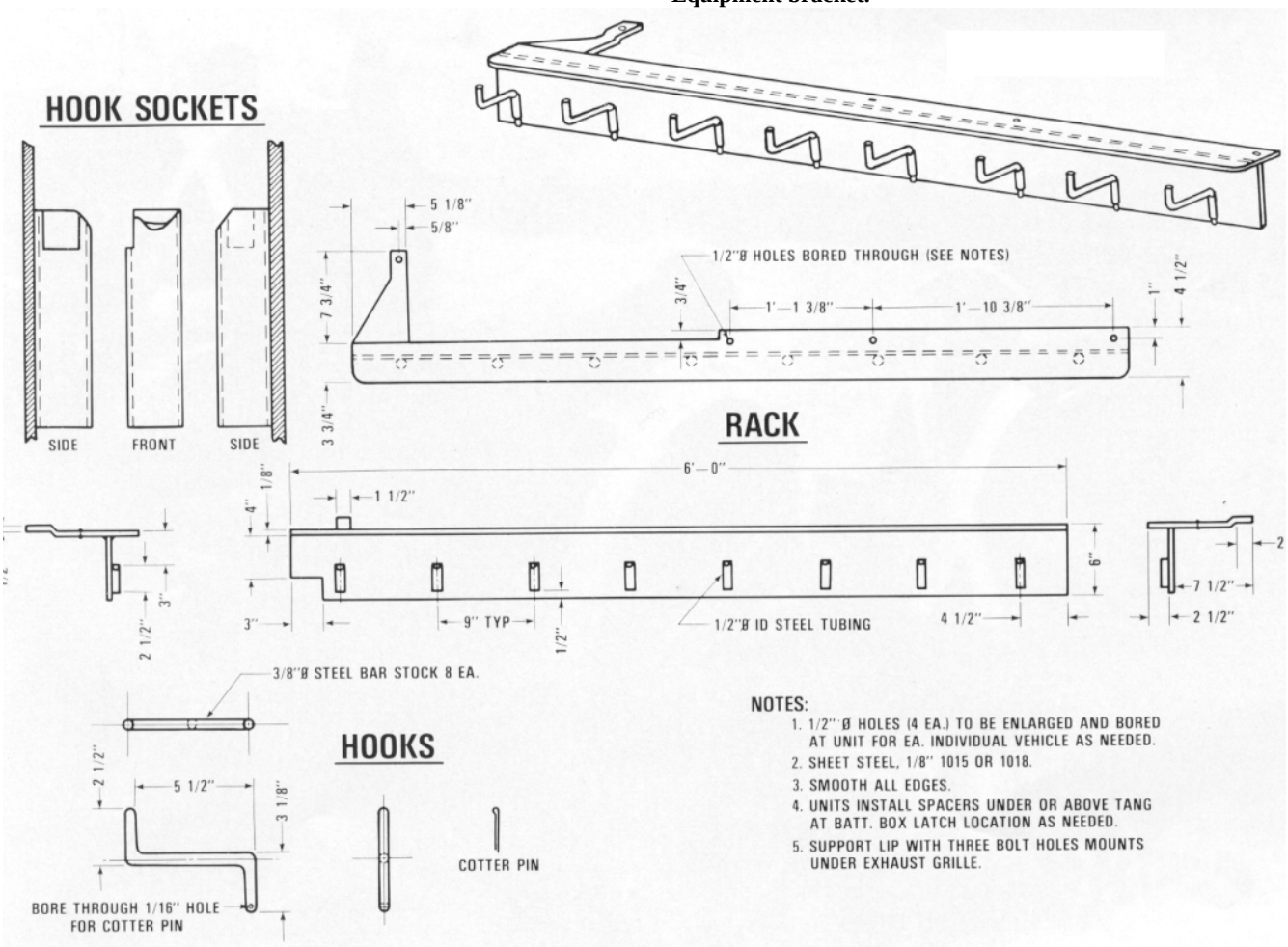
FORT SILL, OK—The Lance missile system is the corps commander's primary artillery weapon for providing massive and accurate long range fire support to the combined arms. Each missile crewman carries an M16A1 rifle in addition to his other equipment. However, while mating and firing rounds, personnel must remove their individual weapons, load bearing equipment, and helmets and place them in a convenient location so that they will be readily available when needed.

Since the field of the Lance missile system in 1972, several weapons have been lost or damaged, particularly during hours of darkness. To preclude this costly situation, W01 Victor M. Nunez (Headquarters and Headquarters Battery, 214th Field Artillery Group) and Mr. Jerry D. Holstein (Maintenance Division, Directorate of Industrial Operations) at Fort Sill have designed and developed a weapons and equipment bracket that will alleviate the problem. The bracket is constructed of 1/8-inch steel, reinforced with a plate welded 90 degrees to the top. Eight equipment hooks are mounted on the front plate to hold the crewmen's individual equipment. The hooks made from 3/8-inch common steel bars, are inserted into holders that allow them to rotate freely so that they can be placed into a folded position during travel.

The weapons bracket, which can be easily mounted on the right side of the M667 Lance basic vehicle has already been installed on the vehicles in the 1st Battalion, 12th Field Artillery, and the 6th Battalion, 33d Field Artillery at Fort Sill.



Equipment bracket.



On the fields outside the small colonial village of Yorktown occurred one of the great battles of American history, one in which the field artillery was initially identified as a decisive combat power in the American Army. There, on 19 October 1781, following a devastating artillery seige, Lord Cornwallis surrendered his British Army to George Washington's colonial forces.

Seige warfare

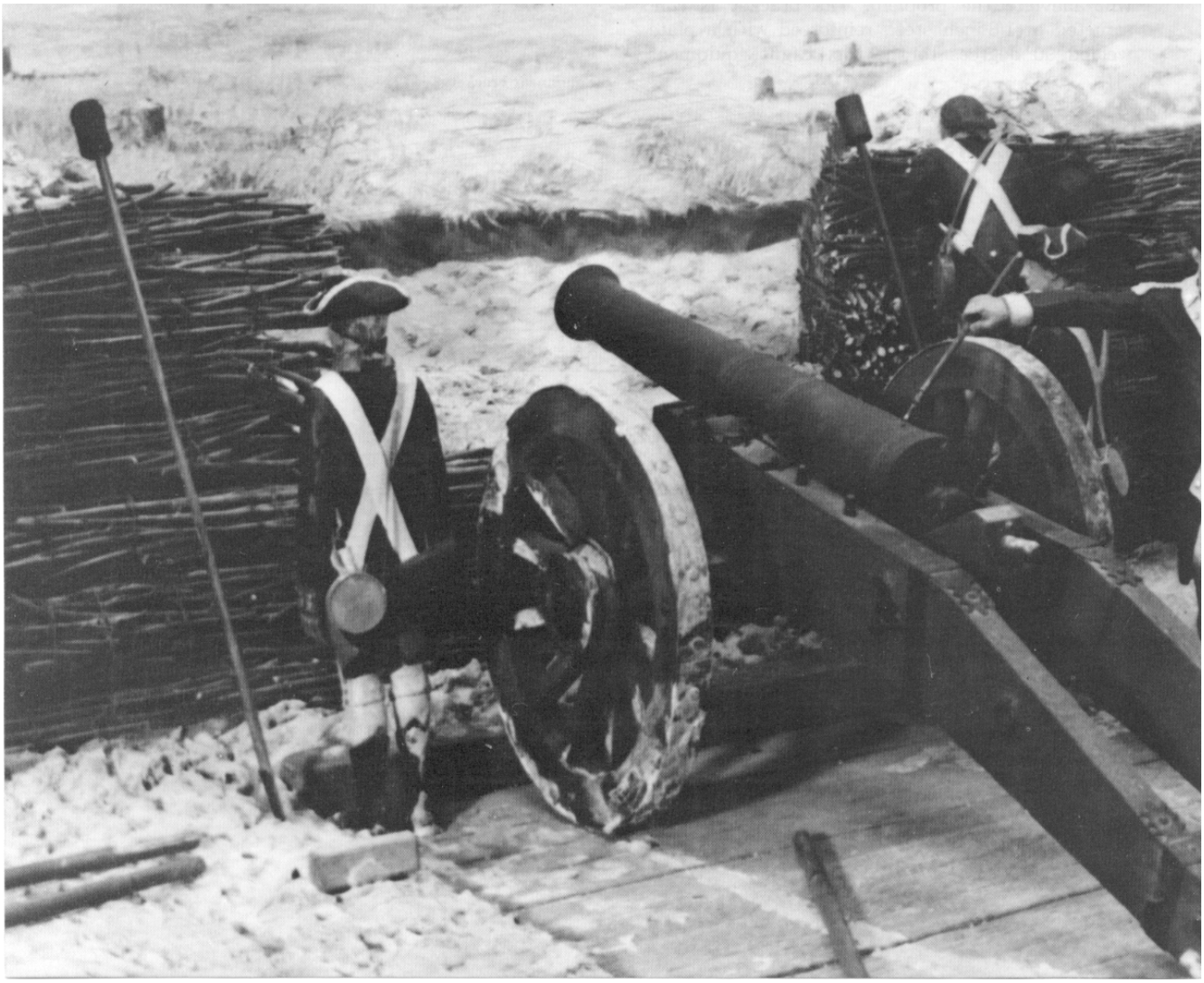
The battle was conducted using seige techniques and adhered primarily to the formal European rules of seige warfare. It is ironic to note that a style of combat never before seen in the colonies was successfully employed against a force which originally contributed many of the basic rules to European seige warfare. Under these rules, the attacking force would open successive lines of trenches parallel to the defensive position. The trenches would be strengthened with built-up areas known as redoubts, which would provide supporting fires for the forward trenches. This progression would continue until the defender's walls were finally breached. Defensively, European seige rules called for the defender to hold position until his walls were breached or the attacker was defeated. If the walls were breached, the defender was to surrender, precluding unnecessary loss of life to both sides and limiting looting of the defended town.

The battle

This was the scenario on 8 October 1781, as George Washington's allied forces opened trench lines opposite Lord Cornwallis' defensive positions around the village of Yorktown, Virginia. Realizing the nature of the prepared British positions and the fact that his artillery outnumbered the British almost two to one (the British having 65 artillery pieces, none larger than 18-pounders, and the combined French-American force having 110 mortar and artillery pieces ranging in size from 3- to 200-pounders), Washington selected his artillery to be the breaching force, with the infantry holding the trenches and securing artillery positions as necessary.

The bombardment began at 3:00 p.m. on 9 October and according to some reports, Washington himself fired the first round. For the next eight days mortar and artillery rounds enfiladed the British position. Cornwallis recorded, "The fire continued incessant from heavy cannon . . . until our guns on the left were silenced, our work much damaged, and our loss of men considerable."

On 11 October a British soldier, Johann Doehler, recorded in his diary that during the previous 24 hours 3,600 rounds had fallen into the town



and among the ships in the harbor. "It felt like the shocks of an earthquake. One saw men lying everywhere who were mortally wounded . . . ." Three days later, the allies advanced their trenches to within 200 yards of the enemy and secured two key British redoubts from which the allied artillery could intensify their bombardment. Allied fire had become so accurate that manning the guns was considered to be the most dangerous duty in Yorktown, and the British rate of fire was reduced to less than six rounds per hour.

Finally, on the morning of 17 October, a British drummer and an officer waving a white handkerchief appeared atop the devastated British position, bringing an end to the bombardment. A message was delivered from Cornwallis to Washington offering surrender, to preclude a final assault and limit further casualties.

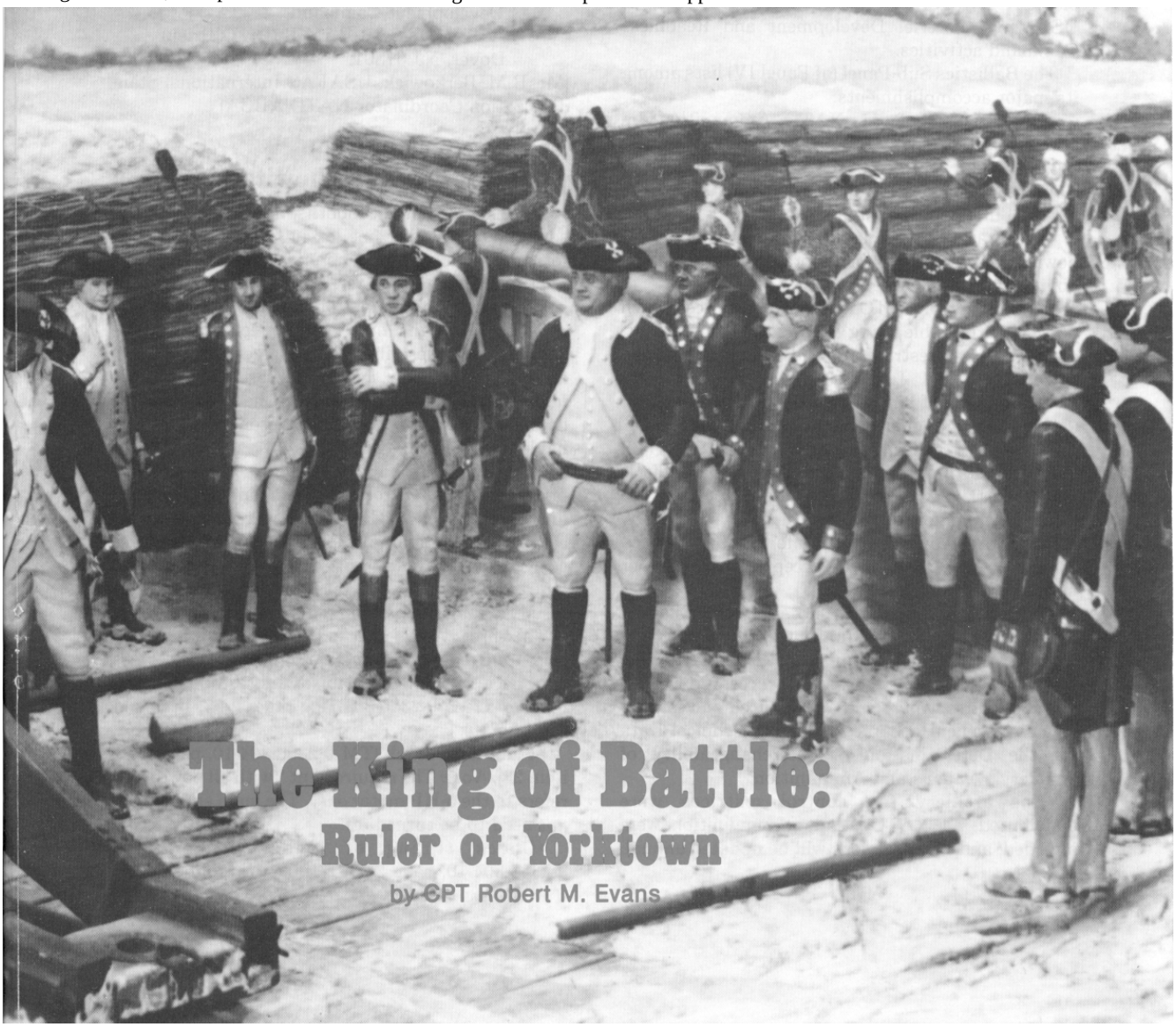
The world turned upside down

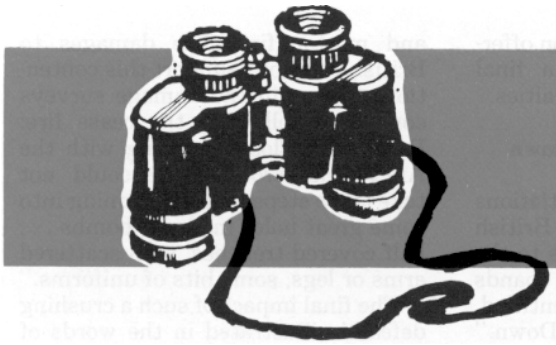
Following two days of negotiations over surrender terms, the British marched out of their positions to the surrender field while their bands played a familiar march entitled, "The World Turned Upside Down." The march was an accurate description of the situation, as soldiers of the world's most powerful king surrendered to a ragged group of rebels.

Although accounts of the number of British casualties differ greatly (ranging from 500 to 1,800 of Cornwallis' 7,300-man force), virtually all sources will attribute at least 85 percent of those casualties to artillery and mortar fire. The damages to British positions support this contention as seen in the damage surveys conducted following the cease fire: Baron von Closen, serving with the Americans wrote, "One could not take three steps without running into some great holes made by bombs . . . half covered trenches, with scattered arms or legs, some bits of uniforms."

The final impact of such a crushing defeat is illustrated in the words of the British prime minister, Lord North, who, upon learning of the surrender stated, "Oh God. It is all over. It is all over." And so it was.

CPT Robert M. Evans is attending the Field Artillery Officers Advanced Course at Fort Sill, OK.





View From The Blockhouse

notes from the school

Rationalization, standardization, and interoperability (RSI) notes

The 30th meeting of the North Atlantic Treaty Organization (NATO) AC/225 Panel IV — Surface-to-Surface Artillery was held at NATO headquarters during the week of 6-10 April 1981. United States representation was provided by Department of the Army (DCSRDA) with support from various US Army Materiel Development and Readiness Command activities.

The Ballistics Sub-Panel (of Panel IV) lists among its major accomplishments:

•Development of the NATO Ammunition Interoperability Plan.

•Successful receipt of indorsements through the Conference of National Armament Directors (CNAD) in a period of six months.

•Preparation of firing table changes for all US howitzers and guns incorporating interchangeability data.

•Publication of NATO fire control matrices which present permissible firing combinations in combat, complete with restrictions and firing table identification.

•Completion of ballistic related STANAGs.

The meeting included the following topics:

•Attendees agreed to ratify STANAG 4144, "Dynamic Firing Techniques to Determine Ballistic Data for Artillery Firing Tables and Associated Fire Control Equipment." The essence of this STANAG is that it will allow fire control information produced by any NATO nation to be accepted by any other nation.

•Germany proposed a NATO study on "Employment of Target Guided Munitions in Artillery."

•The NATO Ammunition Interoperability Review (NAIR) was reported as proceeding well.

•The United Kingdom has produced and is printing an excellent document titled, "Technical Data for the Determination of Interchangeability of Artillery Weapons and Ammunition."

•The artillery fire control matrices were distributed; all NATO weapons/ammunition were included, and the document will be updated annually.

•The direct support weapons system was introduced into Sub-Panel 2 as a model for the generation of a requirement for the future self-propelled howitzer.

Queries regarding the above information/activities should be addressed to:

Commander
US Army Armament Research and
Development Command
ATTN: DRDAR-RAM-R (Dr. O'Brien)
Dover, NJ 07801

(Mr. B.M. Berkowick, USAFAS International Standardization Coordinator NATO/ABCA)

Prefire checks for the M110A2 8-inch howitzer

During the past six months, indications are that some units have become lax in the *mandatory* performance of required prefire checks for the M110A2 8-inch howitzer. These checks must be performed upon occupation of each position and *prior* to firing the first round. Technical Manual 9-2350-304-10 describes these procedures in detail and failure to follow them could result in projectile fallback. At best, the rifling of the tube could be damaged; at worst, an in-bore detonation and probable loss of life.

Some units are only paying lip service to these prefire checks or performing them only prior to leaving the motor pool. This is a dangerous pattern, as the majority of hydraulic line fractures and leaks occur during driving, not firing. An undetected hydraulic leak and the resultant loss of fluid can result, among other things, in a poor ram.

The three *critical* checks that *must* be performed each time a new position is occupied are:

•Check of recoil mechanism and establishing oil reserve (TM 9-2350-304-10, page 2-95, items 1 through 10).

•Fluid level check (TM 9-2350-304-10, page 2-22, item 23). *Note:* The requirement "with all power off" refers to the 5-HP motor *only.* The main engine *does not* need to be turned off.

•Check timing of loader-rammer (TM 9-2350-304-10, page 2-105, items 1 through 10).

The Job Training Program (JTP)

In late 1979, US Army Training and Doctrine Command (TRADOC) started getting feedback from the field that trainers and training managers were confused concerning proper selection and use of the abundance of training products available to them. The problem stemmed from the fact that there were usually three or four products that covered the same Soldier's Manual task. Some products covering the same task addressed different conditions or standards, and others duplicated information without adding anything new. The result was, of course, confusion among Army trainers over which training products to use in order to fully train new soldiers and to buck up experienced soldiers during unit training.

TRADOC began examining all existing and planned training products and pared out those products that were outdated, duplicative, or inconsistent with approved training objectives. TRADOC also cancelled future development of those products that were unnecessary because of the simplicity of the tasks addressed and began development of a training product catalog for each type unit. For example, the draft catalogs included one for each a 155-mm howitzer battalion, a mechanized infantry battalion, and a tank battalion (105-mm).

While all these steps are good fixes for the immediate problem, TRADOC initiated long range planning to eliminate future proliferation of training products. The Job Training Program (JTP) is intended to answer this need. According to TRADOC Circular 351-80-7, dated 8 September 1980, the JTP is "individual extension training developed at the proponent school, consisting of trainer guidance and products for qualifying skill levels 1 and 2 soldiers in a particular duty position or job in the unit." The guidance for training comes in the form of a Plan for Conducting Individual Training in Units (PCITU, pronounced "pick-e-tu"). This plan *recommends* sequencing of tasks, the frequency and method of training, and the best training materials to train the tasks for an MOS or duty position. In the future, the PCITU will appear in the *Trainer's Guide* (formerly the *Commander's Manual* for each MOS at skill levels 1 and 2.

The Job Training Program also provides for a "needs analysis" on every soldier's manual task to determine whether a training product is necessary, which should eliminate the fielding of useless or simplistic products.

The Field Artillery School was anxious to field test this concept and selected MOSs 13E and 17C for evaluation. The School sent the 13E PCITU and guidance on how to use it and two copies of each referenced training product to several division artilleries last April. The units selected were the 2d Armored Division Artillery, Fort Hood; 4th Infantry Division Artillery, Fort Carson; 5th Infantry Division Artillery, Fort Polk; 24th Infantry Division Artillery, Fort Stewart; 9th Infantry Division Artillery, Fort Lewis. After giving these units a chance to use the JTP, USAFAS sent a team of training developers to each of them in August/September. This team conducted a great many face-to-face interviews with NCO trainers to find out what was good and bad about the formats that were used and to determine whether the whole JTP concept was valid. The School is examining this information and will give a full report on the results of this evaluation soon.

While the interviewers were working on the 13E JTP, the 17C JTP evaluation was initiated at Battery C, 25th Field Artillery, at Fort Sill, using the same format as that for the 13E evaluation.

While the JTP concept won't solve all training problems, it is hoped that it will at least make it easier to conduct and plan training. If these early efforts are on track, the JTP concept should have application throughout the training community.

Reserve Component training

The Army has long recognized that Reserve Component (RC) training differs in many aspects from that conducted in the Active Army. Only in recent years, however, has the Army taken steps to address these differences, especially training that could affect Reserve Component readiness as a whole.

The US Army Reserve school system has taken an increasingly important role in the area of MOS training for the enlisted Reserve Component soldiers. Currently, however, these schools face a number of problems that hamper their effectiveness. Among these problems is the absence of TRADOC-approved programs of instruction (POI) for MOS training and adequate training materials to support those programs. At the present time, each USAR school instructor must often develop his own training material for each MOS.

The Field Artillery School is currently involved in a TRADOC-directed effort to solve this problem by participating in a program known as the Special Configuration Project (SCP). The goal of the SCP is to develop a TRADOC-approved POI for each of several Field Artillery MOSs (13E, 13F, 17B, 17C, and 82C) and to support each POI with a complete package of student and instructor material. All materials will be selected with the RC training environment in mind.

Since the requirements for MOS qualification are the same in both the Active Army and Reserve Components, the RC courses will be similar to the resident MOS courses conducted at the Field Artillery School.

The material to support each course will include a course management plan, which will tell the instructor how he is to conduct the course, and a student guide, which will tell the student what he must study and the proficiency he must develop. All references needed by the student will be provided, as will any training aids and audiovisual materials that are needed in the course. In short, each MOS packet provided the USAR schools will contain everything needed to conduct the course with the exception of audiovisual hardware and TOE equipment. These packets will enable USAR schools to offer Reserve Component enlisted personnel an opportunity to become MOS-qualified in selected Field Artillery areas.

Targeting Cell

At the Field Artillery Systems Program Review, held 17 and 18 June this year, the Field Artillery School demonstrated a Targeting Cell in the context of the AirLand Battle. Using off-the-shelf commercial microcomputers and current and near term equipment the demonstration showed how the Targeting Cell interfaced with other staff elements and produced targets, interdiction plans, and strike options in support of the commander's plans.

As outlined in the AirLand Battle concept, the primary purpose of the Targeting Cell was to translate the commander's desired effects into high payoff targets, which are situational and echelon dependent. The Targeting Cell must be intimately familiar with the threat situation and be experts in friendly attack systems of all types including conventional, improved conventional, nuclear, chemical munitions, and electronic jammers. They must also be knowledgeable in friendly acquisition systems to insure that infeasible information about the enemy is not required to make target attack successful. These skills allow the Targeting Cell to indentify what the high payoff targets are, what information will be available on those targets, and how best to attack them.

The demonstration was a joint project of the Counterfire Department and the Directorate of Combat Developments and was supported by personnel of Tactics, Combined Arms and Doctrine Department, USAFAS; the Chemical School; the Engineer School; the Intelligence School; the Combined Arms Center; VII Corps; XVIII Airborne Corps; and the Tactical Air Command. Using the AirLand Battle concept and the planning horizons as discussed, the Targeting Cell developed targets, interdiction plans, and strike options which supported the scheme of maneuver as the commander projected. The Targeting Cell demonstrated the support it would receive from other staff sections in the development of targets, interdiction plans, and strike options. The All Source Intelligence Center, Assistant Division Engineer, Chemical Officer, and G3 Plans interfaces were shown during the demonstration as well as the use of an air liaison officer representative as a full-time member of the Targeting Cell. This integration of effort by a multidiscipline team was the cornerstone of the demonstration. It was shown that, with the combination of skills and knowledge, the Targeting Cell could effectively and efficiently develop the required targets, assessments, and plans to make the AirLand Battle a realistic, achievable method of countering the principle threat on today's battlefield.

Although the Targeting Cell demonstration was located at a division headquarters, targeting cells would also be effective at brigade and corps levels. The demonstration showed that, by collocating the Targeting Cell with the maneuver headquarters, it was able to quickly access the information on the

Targeting Cell console with microcomputer, A&B scopes, and TACFIRE VFMED mounted in a 5-ton expansible vehicle.

enemy, friendly attack system status, and acquisition system capabilities. Additionally, changes in the scheme of maneuver and planning guidance were immediately available to the Targeting Cell. As targets and strike plans were developed, they could be coordinated and passed to the commander for approval without lengthy delays for transmission.

Personnel of the Targeting Cell used several automated aids to assist in the development of plans and targets for speeding communications and providing graphical information in those communications. A microcomputer containing a terrain data base was used to aid in the development of the required targets and plans; however, the interaction among staff agencies is the most critical item in development of the interdiction plans—not the microcomputer. The microcomputer allowed for the speedy call up of detailed intelligence preparation of the battlefield (IPB) and gave a visual representation of the area of concern. It was also used as a means of passing target information from the ASIC to the Targeting Cell. The Tactical Computer Terminal (TCT), which was used to demonstrate the command and control system of passing message traffic, would be especially useful for intrahead-quarters communications in a cellular CP setup. The Tactical Facsimile Device (TACFAX) allowed for the passage of text and graphics between headquarters in hard copy format and thereby gave each a clearer understanding of the plans as they were developed.

The Targeting Cell demonstration showed that, with the expertise and equipment available today, it is possible to apply the principles of the AirLand Battle.

Revision of FM 6-20-2

A preliminary draft of FM 6-20-2 "Division Artillery, Field Artillery Brigade, and Field Artillery Section (Corps)," is currently being prepared by the Field Artillery School's Tactics, Combined Arms and Doctrine Department (TCADD). Suggestions for improvement of the field manual are encouraged and should be forwarded to:

Commandant
USAFAS
ATTN: ATSF-CA-D
Fort Sill, OK 73503

Please use DA Form 2028 (or facsimile) to record comments and reasons for suggested changes. (LTC Bailey, TCADD)

COUNTERFIRE

SYSTEMS REVIEW

Sound/flash ranging update

On 15 April this year, Change 10 to Tables of Organization and Equipment (TOE) 6-307H600 AIM Division and TOE 6-307H620 Airborne Division was published. This change will affect the overall flash ranging capability of the sound/flash ranging platoon. Two obsvation posts (four personnel each) have been deleted and, as a result, the platoon will visually locate targets using the remaining two sound ranging observation posts. Operators will utilize the AN/GVS-5 laser range finder and the M65 battery commander's periscope to obtain polar plot data.

Sound ranging set

A second procurement of the AN/TNS-10 sound ranging set is underway and sets are expected to be ready for issue to the sound/flash ranging platoons by October of this year. These sets will fully equip the platoons; however, a valid requisition must be in the system for issue of the second TNS-10.

Computer

Contract for the OL-274/TNS-10 (HP 9825) computer has been set. These computers will be issued as a component of the AN/TNS-10 sound ranging set. The expected date of issue is October 1981 on the basis of one per AN/TNS-10.

Radio data link

The latest information on the AN/GRA-114 radio data link indicates the expected date of issue as October 1982.

TAB Commander's Conference

Planning is now underway for the 1981 Target Acquisition Battery Commanders' Conference to be held 17-19 November 1981 at Fort Sill. The program is being planned to cover a broad range of target acquisition subjects with particular emphasis on those areas believed to be most beneficial to TAB commanders. Attendees at last year's conference included representatives from the Active Army, National Guard, and United States Marine Corps target acquisition elements.

Attendance is not limited to TAB commanders; anyone interested in target acquisition is welcome. Commanders have stated that past conferences have provided a valuable exchange of information among field units and the US Army Field Artillery School. To provide input for the 1981 conference or to obtain further information contact the Targeting Division, Counterfire Department, by calling AUTOVON 639-6179/3312 or writing:

Commandant
US Army Field Artillery School
ATTN: ATSF-CF-TGT
Fort Sill, OK 73503

AN/TPQ-36 templates

The Counterfire Department, in conjunction with the Fort Sill Training and Audiovisual Support Center (TASC), has developed a planning template for the AN/TPQ-36 radar. The plexiglass template is designed on a scale of 1:50,000 and is intended for planning purposes only.

Units interested in obtaining small quantities of these templates can contact the Targeting Division by calling AUTOVON 639-6179/3312 (reference TD 6-7-7) or by writing to:

Commandant
US Army Field Artillery School
ATTN: ATSF-CF-TGT
Fort Sill, OK 73503

Television films available

The series of educational television films for the weapons support radar repairer (MOS 26B) has been completed.

The following is a list of the 12 remaining AN/MPQ-4A radar TV films that were not published in the May-June 1981 issue of the *FA Journal* and a list of meteorological films used for training the weapons support radar repairer.

To obtain the listed films, check with your local Training and Audiovisual Support Center. If they do not have them, they can be ordered from:

Training and Audiovisual Support Center
ATTN: ATZR-F-ETV
Fort Sill, OK 73503

The films can be ordered individually, by packets (met), or by programs. A blank TV tape is required for each program requested. The entire Met Program can be obtained by furnishing Fort Sill with three 30-minute and four 60-minute blank TV tapes.

AN/MPQ-4A Radar Maintenance Programs

NUMBER	TITLE	RUNNING TIME
221-061-0822B	Organizational Preventive Maintenance Checks and Services on AN/MPQ-4A Radar	19:17
221-061-0823B	Equipment Performance Checklist for the AN/MPQ-4A	23:09
221-061-0826B	DS/GS Corrective Maintenance on Control Indicator Power Supplies of the AN/MPQ-4A Radar	13:03
221-061-0828B	Troubleshooting the Transmitting System of the AN/MPQ-4A Radar	11:20
221-061-0831B	Troubleshooting the 1F Amplifier and STC Assembly of the AN/MPQ-4A Radar, Part II	12:02
221-061-0832B	Organizational and DS/GS Alinements and Adjustments of the Receiving System AN/MPQ-4A	8:45
221-061-0833B	Components and Troubleshooting Procedures for the Indicating System AN/MPQ-4A Radar	24:00
221-061-0834B	Troubleshooting the Indicating System of the AN/MPQ-4A Radar	24:32
221-061-0835B	Computer Accuracy Checks and Alinements of the AN/MPQ-4A	18:42
221-061-0836B	Radar Safety	23:00
221-061-0837B	DS/GS Corrective Maintenance on the RF System of the AN/MPQ-4A Radar	17:48
221-061-0838B	Organizational and DS/GS Adjustments and Alinements on the Synchronizing/Indicating System of the AN/MPQ-4A Radar	14:22

Meteorological Equipment Maintenance Programs

} Groupings constitute complete lesson.

NUMBER	TITLE	RUNNING TIME	PACKET NUMBER	TOTAL RUNNING TIME
420-061-0763-B	Grounding Procedures for Met Equipment	6:45	420-061-ML09	26:00
420-061-0794-B	Generation of Auto Tracking Signals	7:30		
420-061-0786-B	Troubleshooting Baseline Check Set	11:45		
420-061-0764-B	Troubleshooting Procedures, Part I	10:49	420-061-ML10	52:05
420-061-0765-B	Troubleshooting Procedures, Part II	9:15		
420-061-0766-B	Troubleshooting Procedures, Part III	11:31		
420-061-0788-B	Troubleshooting TS-538/U	10:22		
420-061-0812-B	Troubleshooting Rawin Receiver	11:08		
420-061-0791-B	Local Oscillator	24:09	420-061-ML11	29:35
420-061-0787-B	Scanner Assembly	30:26		
420-061-0811-B	Antenna Positioning System	18:00	420-061-ML12	29:35
420-061-0804-B	Troubleshooting AP System	13:30		
420-061-0805-B	Troubleshooting Control Recorder	9:35	420-061-ML13	51:42
420-061-0806-B	Control Recorder, Part I	13:00		
420-061-0807-B	Control Recorder, Part II	13:30		
420-061-0808-B	Control Recorder, Part III	13:00		
420-061-0789-B	Troubleshooting Rawin Set	21:00	420-061-ML15	26:12
420-061-0792-B	Troubleshooting TS-65	12:00		
420-061-0809-B	Radiosonde Recorder, Part I	17:00	420-061-ML14	55:03
420-061-0810-B	Radiosonde Recorder, Part II	12:30		
420-061-0803-B	Troubleshooting Radiosonde Recorder	17:00		

Pads is here!

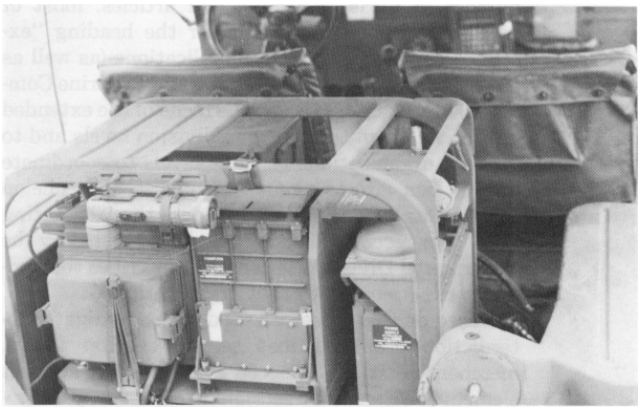
In early July, this year, the School's Counterfire Department received six Position and Azimuth Determining Systems (PADS) which will be used to support USAFAS instruction beginning 1 October 1981.

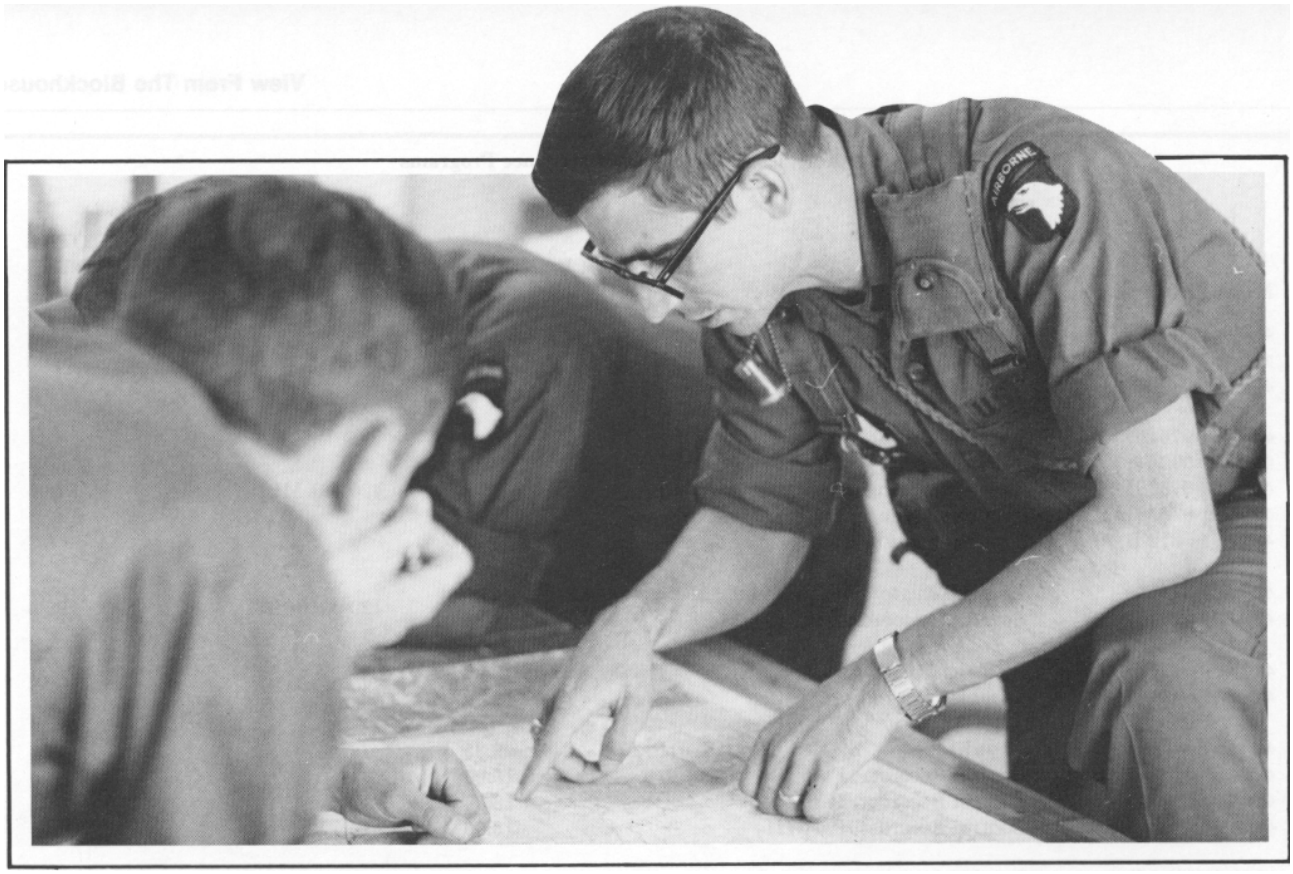
Training for unit personnel receiving PADS in accordance with the Department of the Army fielding plan will be conducted at the unit's home station by a DARCOM New Equipment Training Team (NETT). The NETT will unpackage, inventory, and insure that PADS is fully operational before beginning a 40-hour instructional course to unit personnel. Once the system is operational and personnel are trained, the system will be turned over to the unit.

PADS will allow us more efficient use of our limited manpower and improve combat readiness and efficiency in our mission accomplishment. It was originally designed to do fifth-order survey or one-meter accuracy for each 1,000 meters traveled. It performed to this criteria quite well during the normal developmental testing/operational testing (DT/OT) series.

Validation trials at Fort Sill using specific procedures consistently produced fourth-order survey or one-meter accuracy for each 3,000 meters traveled with an engineering development model. This same model was used at the National Training Center to support their initial set-up efforts and, after 17 days, PADS had completed what would have taken a conventional party a minimum of 105 days to complete.

PADS mounted for ground operations in an M151A2 ¼-ton vehicle.





The Targeting Cell:

A Reality Today

by MAJ Earl P. Guy

As such, divisions can no longer be concerned only with fighting the "guy across the street," they must also determine how to deal with the neighbor who is following him. This interest in looking beyond the frontline has produced an increasing number of ideas, concepts, and articles, most of which can be categorized under the heading "extended battlefield." Recent publications (as well as efforts within US Army Training and Doctrine Command) have begun to bring the focus of the extended battlefield down to corps and division levels and to propose organizations at these levels to coordinate interdiction efforts against enemy second echelon forces. One of these organizations, the "Targeting Cell," was recently organized and field-tested by the 3d Armored Division. This article describes the division's experience with that organization.

Based on this perceived need for a coordinated interdiction effort against second echelon forces, members of the 3d Armored Division's fire support element (FSE) and G2 section discussed ways of going about training for this task. In November 1980, it became apparent that an opportunity would exist during the January 1981 field training and command post exercises to field test such an organization. A Targeting Cell was organized to coordinate the interdiction efforts against those second echelon forces which appeared within 50 kilometers of the forward line of troops (FLOT). These forces (figure 1) were the second echelon regiments of the first

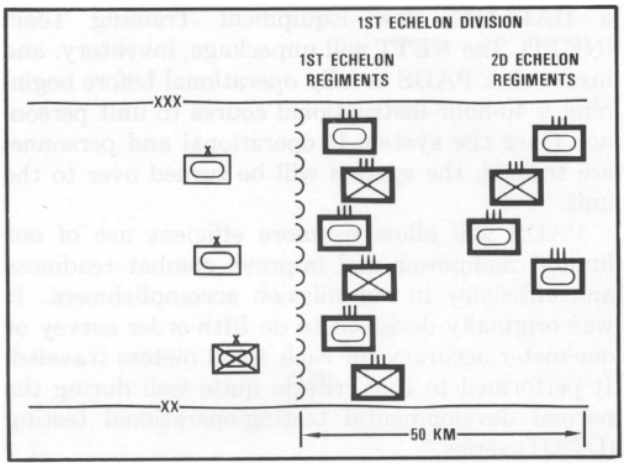


Figure 1.

echelon divisions. The mission of the Targeting Cell was to identify, analyze, and recommend attack options against these units to the G3.

Since the Targeting Cell was concerned with targets and coordinating fire support assets against them, the fire support element coordinated the whole affair. In addition to the FSE, the cell consisted of members of the Combat Aviation Battalion, Tactical Air Support Element, and the G3, G2 (All Source Intelligence Center), and electronic

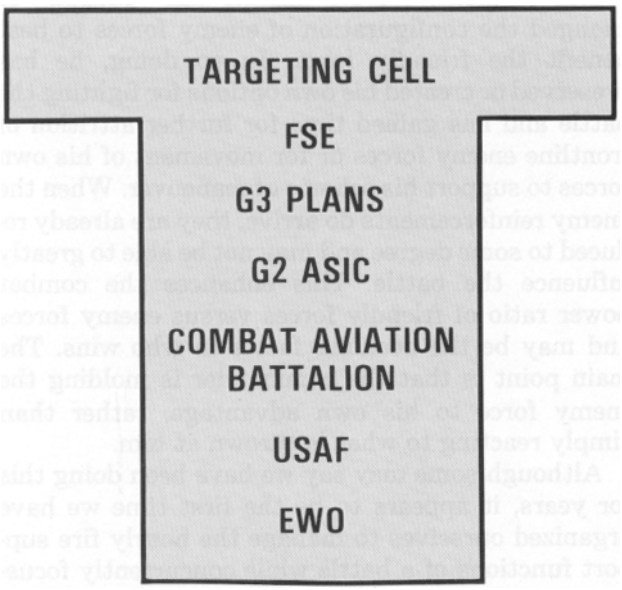


Figure 2.

warfare sections (figure 2). The assistant fire support coordinator was responsible for coordinating all activities. With the exception of the Combat Aviation Battalion (which provided an additional officer member), all representatives came from current assets within the tactical operations center (TOC). The original plan was for the Targeting Cell to meet on an "on-call" basis in the FSE area, which was expanded to include another planning map (figure 3).

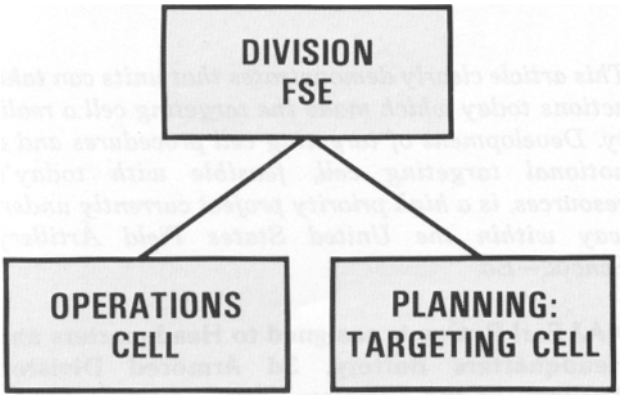


Figure 3.

The G3 was to provide guidance as to:

•Which area the Targeting Cell would focus their effort.

•Which identified second echelon regiments would most affect the friendly scheme of maneuver.

•What effect we wanted to cause upon these elements; e.g., prevent them from reinforcing in a certain area, cause them to shift their movement to some other axis of advance, or simply reduce them as much as possible before they could reinforce frontline units.

From this guidance, the Targeting Cell could determine the major area of interest and task the sensors of the intelligence/electronic warfare system to identify and track battalion size maneuver units within this area. Once these units were identified and their routes determined, members of the Targeting Cell would discuss the various attack options available (artillery, Air Force assets, attack helicopters) and present a recommendation to the G3 (figure 4). For whatever option chosen, there was a Targeting Cell member who could coordinate the further planning of the strike and hand it off to the proper executing agency.

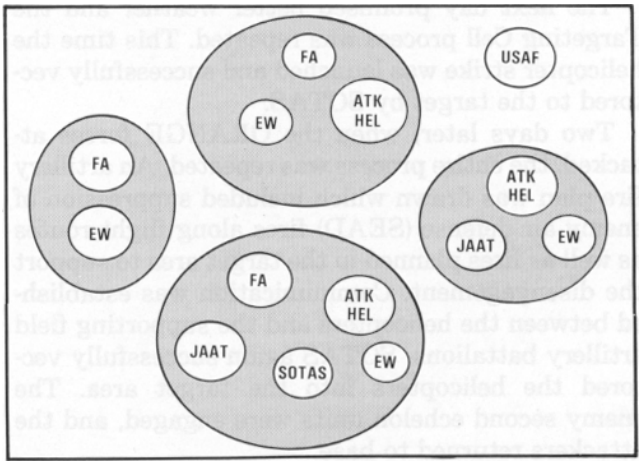


Figure 4.

The maneuver situation planned during Command Post Exercise "Carbine Hammer" was structured so that one brigade opposed another and, twice during the play, one task force would be following another during a movement to contact. This would happen once on the BLUE side and once on the ORANGE side (figure 5). Such a scheme of maneuver presented the division staff with a real "second echelon" situation (the following task force being the second echelon). The idea was for the Targeting Cell to go through its entire process, from G3 guidance, through target identification and recommendation of attack options, to actual engagement, with potential use of attack helicopters, A-10 aircraft, and artillery. A Stand Off Target Acquisition

System (SOTAS) was also available and would be used to vector the helicopters along "relatively safe" routes to the target. The training value for the Targeting Cell was obvious: a full-scale shakedown of the procedures to attack second echelon units.

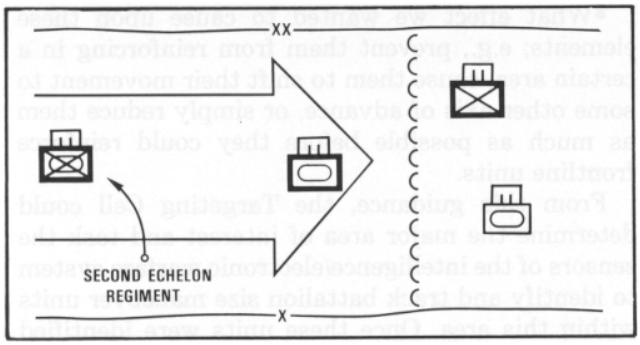


Figure 5.

The first "walk-through" gave the Targeting Cell members a chance to become familiar with the procedures and what was expected. Upon receiving the attack options, the G3 decided on a deep strike by attack helicopters, vectored to the target by SOTAS. Poor weather, however, forced cancellation of this plan.

The next day promised better weather and the Targeting Cell process was repeated. This time the helicopter strike was launched and successfully vectored to the target by SOTAS.

Two days later, when the ORANGE forces attacked, the entire process was repeated. An artillery fire plan was drawn which included suppression of enemy air defense (SEAD) fires along flight routes as well as fires planned in the target area to support the disengagement. Communication was established between the helicopters and the supporting field artillery battalions. SOTAS again successfully vectored the helicopters into the target area. The enemy second echelon units were engaged, and the attackers returned to base.

Although there were limitations, the exercise demonstrated several points and highlighted the necessity for a single organization to manage and coordinate the interdiction effort against second echelon units. It also demonstrated the probable effectiveness of an organized effort by all fire support assets against enemy units and raised several important questions:

•Can helicopters and/or Joint Air Attack Teams (JAAT) be successfully vectored through a high threat environment to attack second echelon units?

•What is the survivability of SOTAS? Can the entire effort be coordinated so that everyone is in the right place at the right time?

•Can our sensors provide enough real-time target information upon which to base our attack efforts?

•Finally, what are the payoffs?

These are tough questions; the answers to some of which will not be determined until an actual situation exists. On the other hand, getting three or four fire support assets together on a target is routine artillery business, although sometimes complicated.

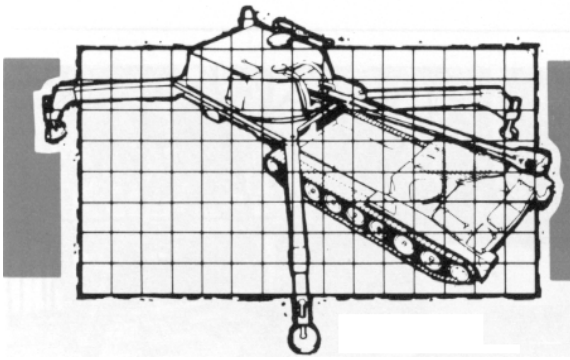
What about payoffs? What benefits will the commander receive because of the efforts of his Targeting Cell? By interdicting second echelon regiments and causing delays or diversions to other routes or areas, the commander has "shaped" or changed the configuration of enemy forces to best benefit the friendly force. In so doing, he has preserved or created his own options for fighting the battle and has gained time for further attrition of frontline enemy forces or for movement of his own forces to support his scheme of maneuver. When the enemy reinforcements do arrive, they are already reduced to some degree and may not be able to greatly influence the battle. This enhances the combat power ratio of friendly forces versus enemy forces and may be the deciding factor in who wins. The main point is that the commander is molding the enemy force to his own advantage, rather than simply reacting to what is thrown at him.

Although some may say we have been doing this for years, it appears to be the first time we have organized ourselves to manage the hourly fire support functions of a battle while concurrently focusing on the task of preventing or delaying reinforcement of enemy frontline units. With this dual focus, the overall objective of achieving more favorable combat power ratios should be attained. The Targeting Cell is a logical and effective means of managing these efforts.

We should expect even greater dividends when we receive TACFIRE, improved weapons and munitions, and new systems in the electronic warfare field. We do not have to wait, however, because this organization can be a reality today. It is in the 3d Armored Division!

This article clearly demonstrates that units can take actions today which make the targeting cell a reality. Development of targeting cell procedures and a notional targeting cell, feasible with today's resources, is a high priority project currently underway within the United States Field Artillery School.—Ed.

MAJ Earl P. Guy is assigned to Headquarters and Headquarters Battery, 3d Armored Division Artillery, as the Division Assistant Fire Support Coordinator.



FA Test and Development

design • development • testing • evaluation

Firefinder contract

The US Army Engineer Topographic Laboratories (ETL) has awarded a $470,000 contract to Command, Control, and Communication Corporation of Torrance, CA, for a Firefinder Digital Elevation Data Dubbing Facility (DEDDF). Scheduled for completion in August 1982, the system will extract digital elevation data from the Defense Mapping Agency's nine track magnetic tapes and reformat and rewrite the data onto Raymond Cassettes in the special format for the computer-controlled Firefinder Weapons Locating Radar Systems.

The AN/TPQ-36 countermortar and the AN/TPQ-37 counterartillery and rocket radars locate incoming rounds in flight and backplot the trajectory to the enemy gun position. The radars then report these weapons locations to TACFIRE.

Before these locations are sent to TACFIRE, the operator has responsibility to manually height correct the location by reading map contour lines. The operator then takes a series of switch actions to record this corrected height into the systems computer. With the digital map feature, the height of the weapons locations will be automatically recorded at the time of the location. This will help eliminate operator errors during height correction and will save hostile target processing time.

Firefinder generator

The US Army Mobility Equipment Research and Development Command (MERADCOM), Fort Belvoir, VA, has exercised a $4.4 million contract option with Delco Electronic Division of General Motors Corporation and a $2.8 million option with Solar Turbines International for initial production of a 10-kilowatt, 400-hertz, gas-turbine, engine-driven generator set for the Army's Firefinder system. The generator will supply power for the mobile mortar-locating radar system which can detect and track enemy mortar and artillery fire.

Power conditioners, which regulate the flow of electricity the system generates, are manufactured by Delco. Power plants and frames are made by Solar, which also mates the Delco power conditioner to these units to form the complete generator set.

The option being exercised is for 82 units plus spare parts and packaging. Total production contracted for to date is 194 sets.

ARMY LASER—Artillery forward observers demonstrate a laser device that enables them to pinpoint targets for laser-homing and conventional weapons. Called a Ground/Vehicular Laser Locator Designator (G/VLLD), the combination laser designator and rangefinder will be mounted on fire support team armored vehicles and can be used with a ground tripod as shown here. It directs an invisible beam of coded laser pulses at any target the operator can see. These pulses are then reflected from the target like a beacon and can be easily detected by special sensors in aircraft or laser-homing missiles, bombs, and projectiles. The G/VLLD can also precisely locate targets for conventional artillery. Hughes Aircraft Engineering development models of the device have been used to support laser-guided weapon test programs since late 1977. Operating at a pulse repetition frequency commonly used for laser-guided weapons, one of these models was used for more than 15,600 missions without a malfunction.

Automated ammunition handling system for howitzers

A new Field Artillery ammunition carrier for the Army's M109 and M110 series self-propelled howitzers will provide improved ammunition handling, increased armor protection for the crew and cargo, and better mobility over that of the current M548 resupply vehicle.

The new carrier, known as the Field Artillery ammunition support vehicle (FAASV), is scheduled for field introduction in May 1984.

The FAASV consists basically of an armor shell mounted on an M109A2 chassis. It is designed to provide mobility equal to that of the M109A2, as well as small arms and fragmentation ballistic protection for both the crew and ammunition.

Unlike the M548 carrier, which has an overhead crane that provides only a limited self-loading capability, the FAASV features a highly automated ammunition-handling system. This system includes an externally-mounted, 1,500-pound-capacity crane, a mechanical stacker, and a conveyor belt which will assist in loading ammunition aboard the vehicle and feeding it into a howitzer.

In operation, the crane will pick up special honeycomb storage racks, previously loaded at an ammunition supply area, and lower them through the top door of the FAASV where they are secured.

When the FAASV arrives at the forward combat area, it is backed up against a howitzer. A crew member will slide a projectile from one of the honeycomb rack tubes onto the stacker and then slide the projectile from the stacker onto the conveyor, which will in turn transfer it into the howitzer.

"The FAASV will have the capability to deliver ammunition at a rate faster than the howitzer can fire," said MAJ Arthur S. Remson, US Army Tank-Automotive Research and Development Command (TACOM) Deputy Weapons System Manager for the FAASV. "It will be a vast improvement over the M548 ammunition carrier. With the M548, the crew has to do almost all of the work by hand. At the supply area, the onboard crane loads pallets of ammunition onto the bed of the vehicle, but from that point on everything has to be done manually. At the battle site, a crew member cuts the bands that secure the ammunition to the pallet. It is then necessary to physically lift each round and hand it to personnel on the ground, who then must carry it to the howitzer. This work is strenuous, since the 155-mm (6.1-inch) round used in the M109 weighs about 109 pounds, and the 8-inch M110 projectile weighs about 207 pounds."

Figure 1. Field Artillery ammunition support vehicle.

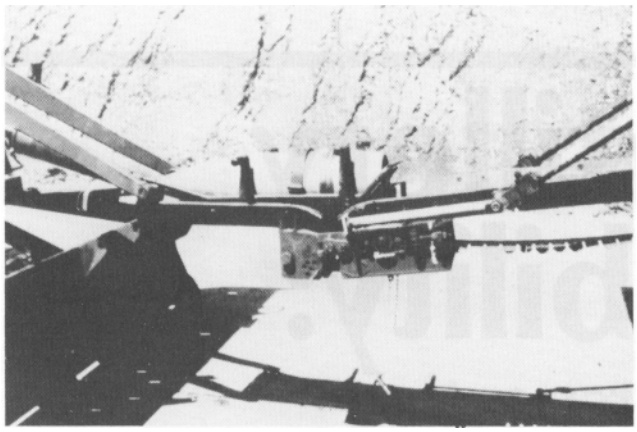
Remson said one FAASV will be able to support the M109 or M110 howitzer without making changes to the vehicle or ammunition-handling equipment. When supporting an M109, the FAASV will carry nine honeycomb storage racks, each containing ten 155-mm rounds. For M110 support, the vehicle will carry 48 of the 8-inch projectiles in six 8-round racks.

In addition to providing improved armor protection and ammunition handling, the FAASV will be highly beneficial from a logistics standpoint. Remson pointed out that since the FAASV and M109A2 use the same chassis, roughly 50 percent of the components are the same for both vehicles.

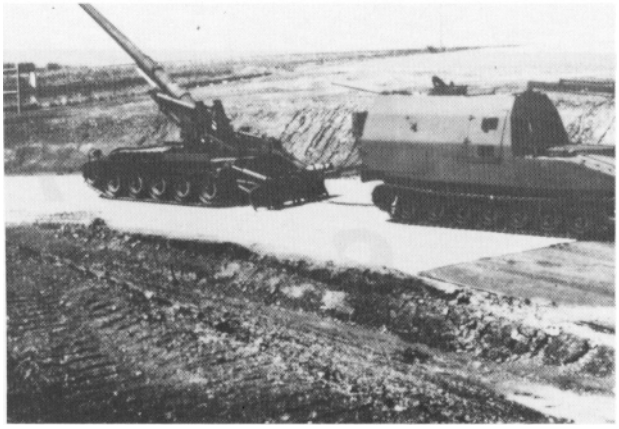
"With so much component commonality," Remson noted, "we will gain some important advantages. For one thing, stockage and storage of spare parts will be simplified, and we will save money through reduced record-keeping costs."

"Another benefit," he added, "is that FAASV and M109 howitzer maintenance and operating procedures are virtually the same. Therefore, personnel training will be greatly simplified, and FAASV and M109 howitzer crews will be interchangeable."

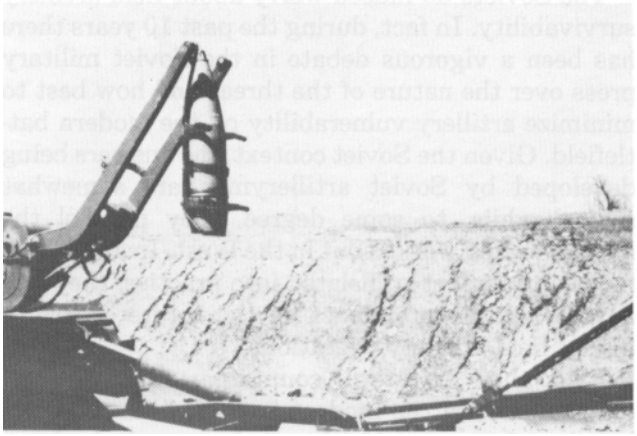
Remson said the FAASV incorporates several advanced systems not present in the M109 vehicle family but which are planned for adoption in a product improvement program. These include an automatic fire suppression system; a nuclear, biological, and chemical protection system; and the Army's new simplified test equipment for internal combustion engines. In addition, a high capacity auxiliary power unit for onboard electrical and hydraulic equipment will be incorporated. Also



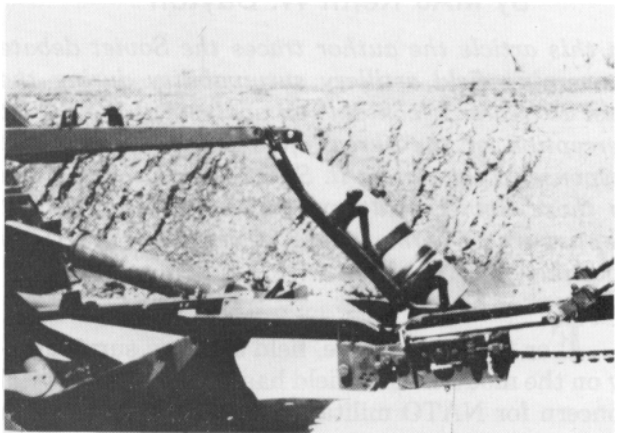
Projectile on conveyor.



FAASV and M110 self-propelled howitzer.



Projectile ready for loading in gun.



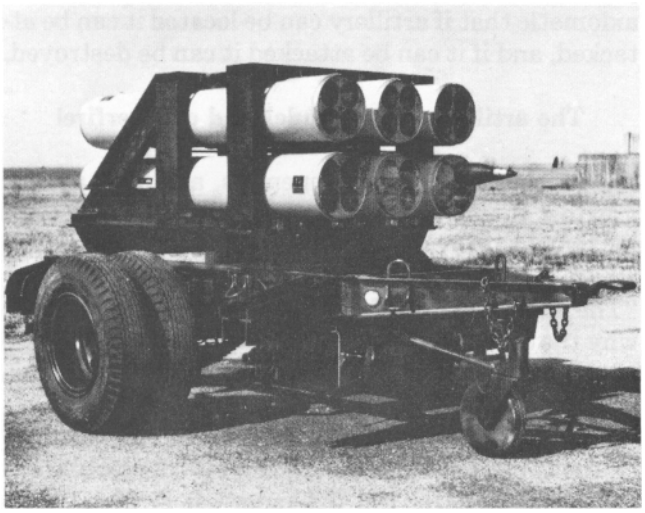
Projectile being picked up by M110.

Figure 2. FAASV projectile loading sequence.

featured is an improved communications system consisting of an AN/VIC-1 intercom and an AN/VRC-68 small unit transceiver.

The program to develop the FAASV began in 1979 following a comparative evaluation of test beds built on various chassis—a stretched version of the M548 chassis, an XM933 Multiple Launched Rocket System, and an M109A2 chassis. This evaluation led to the conclusion that the M109A2 chassis was most suitable for use in a FAASV concept and, on 19 March 1980, the Army approved a program for development of a vehicle that would use the M109A2 chassis.

The vehicles will undergo a series of tests which are scheduled for completion in April 1982. If all goes well, type classification of the FAASV could come as early as September 1982, with a production contract awarded the following month.



NEW ROCKET SYSTEM—The Development Center at Quantico and the Naval Surface Weapons Center in Dahlgren, VA, are presently completing exploratory development of the Field Artillery Rocket System (FARS). FARS is a highly mobile, rapid-fire, surface-to-surface area saturation rocket system. The development effort is pursuing the use of five-inch "Zuni" rockets, fired from modified LAU-10 rocket pods. The launch platform is a reworked M200 generator trailer chassis, and the entire system will be employed by Marine Corps artillery regiments. (Official USN photo)

Field Artillery Survivability:

The Soviet Perspective

by MAJ Keith W. Dayton

In this article the author traces the Soviet debate concerning field artillery survivability during the past 10 years. It contains an analysis of the Soviet perception of the threat, followed by the Soviet response to counteract it. Special attention is given to those Soviet solutions which mark significant departures from prior existing artillery doctrine.—Ed.

For the past decade, field artillery survivability on the modern battlefield has been a topic of vital concern for NATO military planners. Faced with a four-to-one Warsaw Pact advantage in artillery, NATO has debated at length on the problem of how best to protect this scarce but crucial fire support asset. In an effort to summarize the debate thus far, the *Field Artillery Journal* (May-June 1980) published a comprehensive review of NATO survivability doctrine. Here, the *Journal* article pointed out that, although NATO artillery practice is being modified to stress greater dispersion, mobility, and deceptive/protective measures, much still must be done to reduce artillery vulnerability to Warsaw Pact counterfire and air and ground capabilities. The conclusion is that there are as yet no complete answers and that field artillery survivability remains a major problem area for NATO in the 1980s.

Yet, while the survivability issue is widely discussed in the West, comparatively little is written in the West about how the Soviets perceive the problem. Do they worry about it? Is field artillery survivability primarily a NATO problem about which the Soviets, with their great conventional advantage, have little need to concern themselves? Are the Soviets so rigidly tied to the doctrine based on World War II tactics of mass artillery employment that they are insensitive to the vulnerabilities of artillery on the modern battlefield?

The Soviets do indeed worry about field artillery survivability. In fact, during the past 10 years there has been a vigorous debate in the Soviet military press over the nature of the threat and how best to minimize artillery vulnerability on the modern battlefield. Given the Soviet context, the answers being developed by Soviet artillerymen are somewhat radical while, to some degree, they parallel the answers being worked out in the West. In any event, if they are in fact translated into practice, they will have a significant impact on the future course of Soviet field artillery operations.

Like their Western counterparts, Soviet artillerymen view the modern battlefield as a highly lethal environment. Neither their numerical advantage in artillery tubes nor the recent widespread introduction of self-propelled artillery has lessened their concern for the vulnerability of this primary fire support asset. To a large degree, the threat perceived by the Soviets is similar to that perceived by the West. It focuses on enemy artillery, aviation, and the ground threat from tanks and small infantry units. (The nuclear threat is also cited in Soviet publications but is not discussed in this article.) It is axiomatic that if artillery can be located it can be attacked, and if it can be attacked it can be destroyed.

The artillery threat (radar and counterfire)

The Soviets see the enemy's artillery as the greatest threat to their own artillery on the modern battlefield. As one Soviet colonel (N. Shibayev) wrote in a recent article on artillery survivability, "The main enemy of artillery is artillery. That is why the counterbattery struggle continues to be one of the primary tasks of the firing duel between artillery units."

More specifically, Soviet concern seems to center on the capabilities of modern NATO counterbattery radar, particularly the US radar set AN/MPQ-4A.

This is readily apparent in an article in *Znamenosets* (Standard Bearer, April 1979) entitled "Radar Location of Field Artillery." Even though this article is essentially a "how it's done" discussion of the radar set, it nevertheless emphasizes that the AN/MPQ-4 can determine the location of an enemy firing unit within 30 seconds with an error of plus or minus 10 meters at a range of up to 10,000 meters. (This radar is mounted on armored vehicles in several Western armies.)

The strongest statement concerning the NATO counterfire threat, however, is found in an article by General-Lieutenant of Artillery E. V. Stroganov in the November 1980 issue of *Voyennyy Vestnik (Military Herald).* In comments directed to the middle and upper level Soviet officer corps, General-Lieutenant Stroganov warns that NATO armies have "modern radar reconnaissance stations which are able, on the first round, to fix the projectile of the enemy firing battery in its trajectory and, within 20 to 30 seconds, to determine the coordinates of the battery." After further computing the time the enemy takes to process this data and have the guns ready to fire, General-Lieutenant Stroganov concludes that, with the use of this radar, enemy counterfire can "hit our firing batteries possibly as soon as 3½ to 4 minutes after our first shots are fired."

These few statements show that the Soviets are keenly aware of the threat to their artillery from enemy artillery. NATO counterbattery radar is rated as highly effective and counterfire is considered the most serious threat on the modern battlefield.

The air threat

Air attack was one of the first threats to be considered in the early years of the survivability debate and is seen as coming from both high performance and rotary wing aircraft. Although there is a perceived danger to artillery on the move, the primary Soviet emphasis is on the threat to units in firing positions. Soviet doctrine acknowledges that, often, combat operations will be carried out in conditions where the opponent may have local air superiority. Thus as Soviet author V. Ivanov noted in an article entitled, "Obespechit' Zhivuchest'

Batarey" (To Ensure Survivability of the Battery), ". . . in modern battle, artillery units will find themselves in conditions of continuous and active pressure from enemy aircraft." He further observed that, given the standard Soviet linear positioning of the guns on the firing position, "the probability of destruction of the guns during an air attack along the front of the battery will be greater than if the guns are deployed in an arc or semicircle."

This concern for artillery vulnerability to airstrikes was repeated in another survivability article in October 1975. Again, citing the traditional linear positioning of artillery as highly vulnerable to airstrikes, the author encouraged more dispersed firing positions so that "enemy aviation is forced to destroy the firing position, not as a single linear target, but as a group of individual targets. Naturally the artillery's survivability is increased." In case anyone missed the message, the author concluded that "the ability to find and destroy artillery has increased. This is connected with the appearance of radar location, night vision devices, air reconnaissance means and, especially, helicopters."

As the above statements show, there is considerable Soviet concern over the enemy air threat. The standard linear deployment of Soviet artillery is seen as particularly vulnerable to both helicopters and high performance aircraft.

The ground threat

Third on the list of perceived threats to artillery are enemy tanks and airborne and small infantry units. On the modern battlefield, Soviet artillerymen expect that occasionally artillery units may have to defend themselves against a ground attack. Thus, almost every article on survivability contains reference to the battery's need to establish good close-in security and self-defense. Typical is a statement from an October 1971 article wherein the author acknowledges that artillery will normally be operating as part of a combined arms force and therefore would be included in the general scheme of defense. "However," he warns, "artillery commanders are always obliged to immediately organize close-in security and self-defense and be ready at any moment to forestall and successfully repel an enemy surprise attack."

The most serious ground threat is seen as enemy tanks; thus, Soviet artillerymen place heavy emphasis on defeating tanks by direct artillery fire as part of battery defense. For this reason "any battery, regardless of type of weapon, must present an insurmountable obstacle for tanks . . . . One of the major requirements for artillery defense is the constant readiness of artillery of all systems to conduct fire on tanks." Soviet artillerymen are continually reminded of situations in World War II where enemy tanks frequently made surprise attacks on artillery positions. Thus, battery commanders are admonished that "firing positions are selected as a rule on tank-dangerous avenues of approach and every position is prepared for all-round defense . . . every gun is prepared for firing on tanks."

Although lower in priority than the artillery or air threat, the ground threat remains a serious concern for Soviet artillerymen. Surprise attacks by tanks or infantry are seen as just as dangerous as counterfire or airstrikes.

The Soviet response

Soviet artillerymen are well aware of the vulnerabilities of field artillery on the modern battlefield. They rate enemy artillery, air, and ground threats as very substantial and dangerous to their own forces. Ways to counter these threats are very much at the heart of the ongoing Soviet survivability debate.

While the Soviet debate over field artillery survivability has highlighted artillery vulnerabilities, it has also resulted in an ongoing revision of traditional Soviet artillery practice. Old ways of employing artillery are being challenged by new methods designed to enhance survivability. So far these new ideas have centered around innovative methods of positioning artillery on firing positions, increased emphasis on artillery mobility (to include rapid displacements within and between firing positions), and methods to sharply reduce the time spent in fire missions (including discussion of more battalion fire missions as opposed to battery). On a less innovative level, there has also been a reinforcement of old survivability concepts of protection and deception, largely to counter the ground threat. The net result of these survivability measures appears to be a significant revision of existing Soviet methods of employment of artillery.

Firing point revision

The initial Soviet response to artillery vulnerability was to propose changes to the standard positioning

of artillery on firing points. This was mainly to counter the air threat, but also served to degrade the effectiveness of enemy counterfire. Firing point revision proved to be highly controversial and still has not been fully resolved.

The traditional Soviet artillery firing position has the guns on line with intervals of 20 to 40 meters between individual pieces. This tactic was based on the experience of World War II and greatly simplifies the computation of firing data and control over the unit by the senior battery officer. As late as November 1972 a Soviet author wrote in *Voyennyy Vestnik (Military Herald)* that "usually the guns are deployed on the firing position in line and when possible at equal intervals and without significant echelonment. This facilitates the control of firing." The linear configuration, as previously stated, however, is highly vulnerable to enemy air attack and counterfire.

The debate over firing position configuration began in earnest in October 1975. In an article entitled "K voprosu o zhivuchesti artilleriyskikh" (Toward the Question of Survivability of Artillery Units), the authors (V. Ivanov and V. Nesterov) asserted that "the 'broken' *(lomanyy)* formation better corresponds to the mobile, dynamic character of modern combat." The argument was that a nonlinear positioning of the guns would reduce the effectiveness of enemy air and artillery strikes. In 1976 there were several articles published in *Voyennyy Vestnik* discussing the pros and cons of this new concept. Favorable comments about the new configuration centered around the enhanced survivability it would offer a firing unit. Thus, one officer wrote: "Although the traditional linear firing position facilitates the organization and conduct of fire, at the same time it makes the firing position more vulnerable since the guns are positioned in the most dense area of the projectile sheaf." Another contributor stated that, in his unit, many of the officers agreed that in most cases it was advisable to replace the linear positioning of guns on the firing position with an irregular one because "a linear firing position has become an extremely lucrative target for all types of fire destruction means . . . among them modern artillery weapons and aviation." A further advantage of the new dispersed and irregular firing position was that "for destruction of guns on a firing position of 500 meters front by 300 meters depth, the enemy must use at a minimum two battalions of 155-mm howitzers and about 1,500 rounds."

At the same time, however, there were dissenting voices. Most of them accepted the survivability argument but felt that the abandonment of the traditional linear firing position would seriously complicate the task of computing firing data and thereby slow down the battery's responsiveness. Thus, N. Shibayev wrote in August 1976 that, although he agreed that an irregular formation increased survivability, "Dispersion on a large scale requires individual piece corrections for each gun and thus cannot be justified since the battery then loses its significance as a combat entity, and more time would be required for the preparation to fire." The common complaint was that existing Soviet gunnery procedures did not adequately address the piece correction requirements imposed by irregular positioning; without automatic or mechanical field artillery computers at the battery level, it would take too much time to obtain correct firing data. In this vein another officer from the field wrote that "the striving to increase the area of the firing position in the interests of raising survivability is to a certain extent justified . . . But in our view it is not advisable to get carried away with it." He added that if the guns were deployed in line, then "we can use the methods for piece corrections outlined in the Rules for Gunnery *(v Nastavlenii po Ognevoy Sluzhbe)*."

In October 1976 the deputy commander of Soviet Rocket Troops and Artillery, General-Lieutenant I. Anashkin, attempted to close the debate on firing point revision by indorsing neither the new nor the old configurations. "Evidently it is advisable to thoroughly study the recommendations about the 'irregular' distribution of the weapons on the firing position," he wrote. But then he added, "Of course the linear formation on the firing position in certain circumstances is advisable, especially during the concentration of a large amount of artillery on a narrow sector of the front." He concluded his comments with the caveat that "in dynamic and fast moving battle (e.g., in meeting engagements, in the depth of the enemy defense, in the mountains etc.) the necessity for a non-linear distribution of the weapons may arise." There was evident uncertainty over firing point revision at top echelons in the Soviet command structure.

General-Lieutenant Anashkin's comments were not the last word on the matter, however. In August 1978 another article appeared in *Voyennyy Vestnik* entitled "K vopvosu o zhivuchesti artilleriyskikh

batarey" (Toward the Question of Survivability of Artillery Batteries). In it the author asserted that "from the point of view of increasing survivability of the artillery battery . . . we consider that the 'broken' configuration of the battery front is in accordance with the mobile, dynamic character of modern battle." In a September 1978 article on the employment of self-propelled howitzers in the defense, it was asserted that "the weapons of the battery in the firing position, as a rule, do not have to be positioned in a line." This was followed a year later by an article giving detailed examples of how to compute individual piece corrections for guns in non-linear firing positions. The author prefaced his charts and diagrams with the comment that "a nonlinear positioning of the guns on the firing point increases the survivability of the artillery unit."

And so the debate continues. Nevertheless, in light of the above excerpts it appears that Soviet artillerymen are moving away, however reluctantly, from their traditional linear firing positions in favor of something more dispersed and irregular. The reason is to enhance the firing unit's survivability and degrade the air and artillery threats. It must be noted, however, that Soviet photos of artillery in action still invariably show the guns positioned in close, straight lines.

Movement

Whereas firing point revision has caused a vigorous debate in the Soviet military press, the discussions surrounding the emphasis on more rapid and frequent movement by artillery units are more uniformly favorable. The threat being countered by this measure is again enemy artillery and aviation with the emphasis this time on artillery. Rapid and frequent movement, say the Soviets, degrades the effectiveness of counterfire.

Even before the advent of modern Soviet self-propelled artillery, it was recognized that "in increasing the battery's survivability, a very large role is played by timely and concealed maneuver . . . the emergency calling for the prime mover and rapid departure from and occupation of firing positions." By the mid-1970s the introduction of new self-propelled 122-mm and 152-mm howitzers made rapid movement more feasible. The guns could move faster and the supported units would lose less artillery support time due to artillery being on the move; survivability would likewise be enhanced. Emphasis was now being placed on firing a few missions and then leaving the firing position before enemy radar-directed counterfire or airstrikes could destroy the firing unit.

Therefore in April 1976, *Voyennyy Vestnik* carried an article which stated that "Movement occupies an important place in the struggle for field artillery survivability . . . . Results show that using intra-positional movement can raise the survivability of the battery by 15 to 20 percent." The author concluded his article by stating that "In a contemporary fast-paced battle, the role and significance of movement for insuring artillery survivability has grown even further. The primary condition for success in this is timeliness of movement." By timeliness, he explained that he meant "when a battery, after completion of its fire mission, abandons the position before the enemy opens fire on it, or at the moment of opening fire by the enemy."

The survivability aspect of rapid movement was heavily stressed. Readers were reminded that enemy artillery reconnaissance was able to find the firing battery and determine its coordinates within two or three minutes after it opened fire. Another two to four minutes were required to work up firing data and then two to four minutes were needed for the enemy guns to be ready to fire. Therefore "it follows that an artillery battery firing a mission lasting three to four minutes will be able to complete it without enemy retaliation and begin to leave. If it takes five to seven minutes, the battery partially or completely will fall under enemy fire." The message was to shoot a quick mission and then move to another firing position to escape enemy counterfire.

By 1978 this emerging doctrine had reached the point where the mobility of self-propelled howitzers was openly being called their greatest survivability asset. As V. Barsukov noted, "The greatest advantage of self-propelled howitzer batteries is their ability for wide mobility of their firing platoons. Frequent and rapid changing of firing positions allows for significantly raising their survivability." This led the writer to suggest that self-propelled battery commanders be assigned a firing position area instead of specific firing points. Then he could select several firing positions so that "from each firing position the guns can fire one or two fire missions, after which the battery must abandon it."

The Soviets are also giving increasing attention to movement of individual weapons within a firing position from primary locations to temporary ones. "The most realistic solution to the problems of survivability,"

argued N. Shibayev, "is the movement of firing platoons on the firing positions, or rather their change after the completion of one or several fire missions. Thus, in addition to the primary, it is advisable to select and prepare several reserve firing positions at a distance of 300 to 400 meters." Soviet commentators note that self-propelled artillery is much better suited to this operation than towed artillery. As one of them recently pointed out, a battery of 152-mm self-propelled howitzers requires about five times less time than a similar towed battery for movement from a primary position to a temporary one and subsequent readiness to fire.

Largely for survivability reasons, therefore, Soviet artillerymen are moving away from the traditional practice where a battery would occupy a firing position and displace only when it was in danger of falling out of range of supported troops. Emphasis is now being placed on the ability to shoot a few quick missions and then rapidly displace to a new firing position.

Shorter fire missions

The need to save time in firing prompted by the artillery counterfire threat has led to what may be the most radical Soviet response to the survivability problem. It is now being suggested that adjust-fire missions and registrations are out-of-date because of the enemy counterbattery radar capability. Moreover, it is being suggested that batteries firing independently are too vulnerable and ineffective on the modern battlefield and that more fire missions should be accomplished by battalions firing in mass.

These ideas first appeared in an article by General-Lieutenant of Artillery Stroganov in the November 1980 issue of *Voyennyy Vestnik*. They subsequently received the tentative indorsement of the Marshal and Commander of Soviet Rocket Troops and Artillery (I. Peredel'skiy) the following month. General-Lieutenant Stroganov introduces his argument with a thorough analysis of NATO counterfire capabilities and implies that, as a result of their lethality, some current methods of artillery employment are out-of-date. In particular, he discusses adjust-fire missions and registrations by batteries. His point is that such missions take too much time to complete, their effects are not very great, and they warn the enemy and give him ample time to prepare answering fire. He expands this argument to suggest that batteries firing alone are by their very nature highly vulnerable.

General-Lieuitenant Stroganov's solution is something he calls the fire strike *(ognevoy udar)*. Simply stated, it means that all the guns of a battalion fire at the same time on a single target. Thus, the time needed to have the desired effect on the target would be sharply reduced while the density of fire would be increased. As he states it, "Considering the number of rounds fired at the target, the time required for the completion of the fire mission (by the battalion) is three to four times less, and the reliability of its completion is sharply increased." The battery firing alone is perhaps out-of-date. He concludes that "It is completely evident that to target one firing battery (requiring from 7 to 33 minutes for its mission) in the presence of modern enemy reconnaissance means does not give the enemy much difficulty in targeting." But, and this is the main point, "To locate and define with the necessary accuracy the coordinates of three batteries firing for a short period (from two to 10 minutes) and conducting fire simultaneously is far more difficult."

In a follow-on article, Marshal of Artillery Peredel'skiy agreed that the battalion was the basic artillery firing unit. He also indorsed the idea of firing missions without adjustment or registrations as a means to save time and achieve greater effect. It is too early to tell whether these ideas will be translated into actual practice, but if they are it will be another example of how survivability considerations are leading to far-reaching modifications of existing Soviet artillery practice.

Deceptive/protective measures

On a more mundane level, the survivability debate has also reinforced interest in several tried and true techniques, such as camouflage, dummy firing positions, roving guns, direct fire against tanks, security, self-defense, and engineer preparation of firing positions. This has not led to significant revisions in doctrine but does illustrate how thoroughly the Soviets are considering the ground threat and attempting to counter it.

Among the tried and true survivability techniques, camouflage continues to be emphasized as foremost. Artillery units are being constantly exhorted to better observe camouflage discipline with emphasis on covering vehicle tracks into firing positions. Of some interest, however, are periodic comments from commanders indicating that there are shortages in appropriate camouflage material.

Widely used in World War II, dummy *(lozhnyye)* positions both for guns and observation posts appear frequently in survivability discussions. As Soviet author I. Epifanov noted, "Heightening of survivability is assited by the use of false gun pits and gun dummies." But again there is dissatisfaction with existing materials. In complaining that the existing dummy material would not fool anyone an officer concluded that "For our camouflage measures, we need not only craftiness but material support on the level of modern technology."

The survivability debate has also led to the revival of the use of "roving guns" which fire from temporary firing positions and thereby deceive the enemy concerning the battery's location. "As a survivability measure it is advisable," writes V. Ivanov, "to accomplish some missions (destruction, registration, etc.) by means of fire from a single gun from a position 200 to 300 meters from the primary firing position."

Engineering preparation *(inzhenernoye oborudovaniye)* also warrants ritual comment in any Soviet discussion of survivability, regardless of the emphasis on rapid and frequent movement. Typical are statements such as "Dispersal of the guns on the firing point with intelligent use of camouflage and thorough engineer preparation of the firing position insures great survivability for the artillery unit"; or "Use of engineer preparation of firing positions can raise survivability by 40 to 55 percent."

Other factors such as direct fire against tanks and close-in security and self-defense against small infantry groups are standard and taken seriously. The point to be made, however, is that these Soviet deceptive/protective measures directed at the ground threat are not very innovative and are not leading to significant changes in doctrine. Compared to ideas such as firing point revision and more rapid and frequent movement or methods to save firing time, the deceptive and protective measures are commonplace.

Conclusion

The past 10 years have witnessed a Soviet debate about field artillery survivability that roughly parallels that in the West. Having identified the threat as coming from enemy artillery, air, and ground forces, Soviet artillerymen have been undertaking a reappraisal of their traditional artillery practices in an effort to decrease artillery vulnerability on the modern battlefield.

Some of the Soviet responses are standard and show little innovation; i.e. the stressing of camouflage, direct fire, etc. But, in at least three areas, the debate over field artillery survivability has resulted in significant changes in Soviet artillery practice.

•First of all, it appears that the traditional close linear firing formation is under revision. For survivability reasons it is likely to be replaced by a more dispersed and irregular positioning of the guns which presents a more difficult target for enemy air or counterfire strikes.

•Second, there appears to be an emerging doctrine of rapid and frequent movement by artillery units to minimize the dangers of enemy counterbattery operations, similar to the US practice of "shoot and scoot," which relies heavily on the mobility of modern self-propelled artillery.

•Finally, there is an indication that the Soviets feel that fire missions must be shorter in duration if the firing unit hopes to survive. Battery adjust-fire missions and registrations are no longer justified because they take too much time. A corollary of this is that battery missions in general may now be out-of-date and that the artillery battalion is now the primary artillery firing unit. Not only does it take a battery more time and with less effect to attack a target, but batteries firing by themselves are simply too vulnerable to enemy counterfire.

The ongoing debate on Soviet field artillery survivability shows that Soviet artillerymen perceive the threat as much as their NATO counterparts. Their response is likewise similar. Both the Soviet Union and NATO are considering larger firing positions, greater mobility, and protective and deceptive measures to enhance survivability. Both are looking for ways to sharply reduce time spent in fire missions in order to degrade the counterfire threat. (In this regard, the Soviet suggestion of more battalion fire missions is ominous in that with a four-to-one advantage in artillery tubes, they can bring that much more firepower to bear.) Field artillery survivability is a game being played by both sides as they attempt to find those measures which can best protect what still remains the primary fire support means for the ground gaining arms.

MAJ Keith W. Dayton is attending the Command and General Staff College at Fort Leavenworth, KS.

REDLEG NEWSLETTER

Educational incentives

In an effort to boost military services' recruiting and retention programs, Department of Defense is conducting a test of new and improved educational benefits for servicemembers. The recruiting test, which began on 1 December 1980, involves four separate programs:

•A loan forgiveness program which is offered nationwide by all the military services.

•A new educational assistance program which is offered by each military service in certain parts of the country. Members in this program, which was suggested by the House Armed Services Committee, cannot take part in the Veterans Educational Assistance Program (VEAP).

•A noncontributory VEAP which is also offered in certain parts of the country by all the military services. This Senate Armed Services Committee proposal would have Department of Defense pay servicemembers' contributions to the Veterans Administration on a monthly basis. Servicemembers may not use the VEAP benefits until the end of their first term of service.

•A super VEAP "kicker" program which is offered only by the Army in certain areas of the country.

Details on these programs are available at Army Education Centers worldwide. Along with the four programs being tested, a reenlistment test plan is under development by Department of the Army.

First sergeant course announced

To improve the effectiveness of the noncommissioned officer (NCO), the Army has developed a course of instruction tailored for first sergeants. The course will be conducted at Fort Bliss, TX, under the auspices of the Army's Sergeants Major Academy. It will be approximately eight weeks long and will be taught by instructors with first sergeant experience who have graduated from the Sergeants Major Academy.

First sergeant designees (E7, E8) and soldiers in grade E7 or E8 who are currently performing first sergeant duties, but have been in a first sergeant position for 12 months or less, are eligible to attend.

The program of instruction focuses on the first sergeant's role as a trainer of soldiers. Other subjects will include unit administration, combat, logistics, unit security, discipline, esprit de corps, and solving soldier problems.

The US Army Sergeants Major Academy has started preparations for conducting the first class which will begin 5 October 1981.

Major commands will select the majority of soldiers (90 percent of each class) to attend the course. These selectees will attend on a "TDY and return to parent organization" basis for utilization as a first sergeant at his or her current duty station.

The other 10 percent, which will be comprised of soldiers who will attend TDY en route to overseas assignments, will be selected by MILPERCEN. MILPERCEN will apply these individuals against first sergeant requisitions for oversea commands and will require that published orders contain a statement indicating that the soldier is a First Sergeant Course graduate and should be utilized in a first sergeant position at the earliest opportunity.

Eligible NCOs wishing to attend the course should apply to their major command rather than directly to MILPERCEN.

Promotion reconsideration

Following the adjournment of each centralized promotion selection board, Department of the Army agencies are flooded with applications from noncommissioned officers requesting promotion reconsideration. The majority of these applications circumvent the chain of command and are sent to the wrong agency. Current guidance requires that these applications be forwarded through battalion or comparable commander and the soldier's military personnel office to Commander, US Army Military Personnel Center, ATTN: DAPC-POS-PE, Alexandria, VA 22332. This guidance is contained in paragraph 7-43, AR 600-200, dated 1 January 1981.

Requests concerning a soldier's relative competitive posture should be sent to Commander, US Army Military Personnel Center, ATTN: DAPC-EP (specify appropriate career branch), Alexandria, VA 22332.

Notes on CSC selection

There are two major changes in the 1981 Command and Staff College (CSC) selection cycle. These changes are the eligibility criteria for consideration and a modification of the actual selection process which will focus competition for selection directly on an officer's basic year group.

Eligibility criteria

In past years, an officer became eligible for CSC upon selection to major. In most cases this occurred in an officer's 10th year of active commissioned service. The officer remained eligible for selection up to the point when he or she exceeded 180 months of active commissioned service based on the commencement of the school year (30 September). For the average officer, the last year of eligibility (LYE) was usually the officer's 14th year of active commissioned service.

Commencing this year, a new eligibility criteria will be phased into the CSC selection process which will better support the Chief of Staff's stability initiatives while minimizing the deferment process. Under the new criteria, an officer will become eligible for selection in his 8th year of active commissioned service and remain competitive through his 11th year. Upon selection, an officer will be programed for attendance between his 9th and 14th year in accordance with the established assignment stability policies.

Selection process

Prior to this year, a list of all officers eligible for selection, with the exception of those in LYE, were submitted to a screening board which pruned the entire population by approximately two-thirds; a list of the remaining one-third, plus all of the officers in LYE, was forwarded to the actual selection board. The criteria for selection by both the Screening and Selection Boards under the old process was the best qualified officers from the total population regardless of year group. Although this process produced fairly uniform and predictable results, minor deviations could potentially occur between various year groups.

Under the new selection process, each officer will be competing for selection only against other officers in his specific year group. Over the years, each year group has historically had between 40 and 45 percent of its population selected for resident staff level schooling. Based on a decision by the Chief of Staff of the Army, each year group will maintain approximately this same level of participation. To bring some uniformity to the process, however, the selection of eligible personnel from each year group will be allocated by the following formula as a year group moves through the eligibility window:

Eligibility	Selection rate
1st year (8th year ACS)	15%
2d year (9th year ACS)	15%
3d year (10th year ACS)	35%
4th year (11th year ACS)	35%

The net result of this procedure will add consistency to the selection process and provide a more equitable opportunity for each officer to be selected.

Phasing in the new system

The challenge facing MILPERCEN and the 1981 CSC Screening and Selection Boards is that of phasing the new eligibility criteria and selection process into the CSC system without penalizing any individual from those year groups considered under the old criteria. To accomplish this, a management group in MILPERCEN's Officer Personnel Management Directorate has analyzed the affected year groups to determine the exact population of each group that has been selected for staff school attendance and compared it to the desired goal of 40 to 45 percent selection for each year group. The resultant difference in the total selected, contrasted to the established goal, was then phased over the number of remaining years of consideration for each year group in accordance with the new selection model. The end result of this exercise guarantees that each individual in year groups 1968 through 1975 will have the same chance of selection that his predecessors enjoyed.

Impact of nonselection

The selection for Command and Staff level schooling is an important aspect of an officer's career and is certainly a goal toward which each officer should strive. The fact, however, that 55 to 60 percent of each year group will not be selected for resident course attendance does not mean that those who are not chosen are substandard officers or that their career is finished. Since only 45 percent of any year group is selected for CSC resident schooling while 70 percent or more are selected for lieutenant colonel, officers should continue to seek professional development through the various Army Command and General Staff College (CFSC) nonresident programs which are available. (Under current Army policy the only MEL 4 producing nonresident course is the nonresident program at CGSC.) In the after-action

report from the recently completed 1981 Lieutenant Colonel Selection Board, the importance attached to successful completion of Command and Staff College level training was clearly highlighted. The board indicated, that irrespective of basic branch or specialty, successful completion of CSC level schooling by any means is considered an essential ingredient of professional development and competitive career programing. The new selection system which completes a year group's total consideration for resident schooling by the 11th commissioned year offers those officers not selected an advantage over the previous system. Under the new system, an officer not selected for resident schooling will have approximately three years to complete the course in a nonresident status before coming into the zone of consideration for promotion to 05 as compared to approximately 18 months under the old process.

1981-82 milestones

The major's Assignment Desk should have a list of the individuals under consideration in early October, this year. The final list of selectees will be simultaneously announced throughout the field in the mid-December 1981 to mid-January 1982 time frame depending on how long the new process takes. Field Artillery Branch personnel do not have prior knowledge of the names on the list nor could they divulge that information if they did, so please have patience and wait for the release date of the list. If you have procedural questions on the system, please don't hesitate to call your FA Branch representative. (MAJ Cordis B. Colburn, AUTOVON 221-0187/7817)

Keep your ORB up-to-date

The Officer Record Brief, more commonly known as the ORB, is a vital personnel management document. It provides commanders and personnel managers with a concise, easy-to-read record of key personnel information. Every time there is a requirement to review an officer's qualifications, the ORB is one of the first documents screened. Such a review might be done by a career manager screening candidates for a particular assignment, or a selection board member evaluating promotion or schooling potential. The one positive step that an officer can take toward influencing assignments, schooling, or promotion is to insure that the information on the ORB is accurate and up-to-date. This can be primarily accomplished through the annual ORB audit followed by the proper submission of all required corrections.

The primary responsibility for initiating ORB corrections rests with the individual officer. However, the responsibility for processing these corrections belongs to the local MILPO. An officer who feels that certain information on the ORB is incorrect should point out the error to the local MILPO and be prepared to document the correction. It is then the MILPO's responsibility to process the corrections in accordance with DA Pamphlet 600-8, Procedure 5-1. If this procedure is not strictly followed ORB corrections will not process to the automated record. After all corrections are submitted, the MILPO should also follow up to insure that they process through the automated system.

New retirement provision for reserves

Army National Guard and Army Reserve enlisted soldiers can now retire after 20 years of active Federal service and draw the same benefits as Regular Army enlistees.

The new program extends to reserve enlisted members the same retirement benefits as Regular Army enlisted members receive. Before, only Reserve Component officers could retire after 20 years of active Federal duty.

Active Federal service includes active duty, annual training, active duty for training, and other full-time training duty performed in a Federal status as a member of any branch of the Armed Forces. It does not include inactive duty training, such as drills, or any duty performed as a member of the Army or Air National Guard under state control.

Individuals interested in retirement may obtain information and applications as follows:

•Members on active duty or active duty for training should contact the military personnel office to which attached.

•Members not on active duty or active duty for training should request information from the military personnel office at the nearest Army installation, or write to:

Commander
US Army Reserve Components
Personnel and Administration Center
ATTENTION: AGUZ-RAD
9700 Page Boulevard
St. Louis, MO 63132

Eligible members who are not on any type of active duty or active duty training should submit an application for retirement without delay.

Revision of AR 600-37

As a result of changes to Article 15 filing procedures and receipt of recommendations from the field and Department of the Army Staff, AR 600-37 (Unfavorable Information) has been revised and distributed to the field. The revised regulation, effective 15 December 1980, establishes policies and procedures for authorizing the placement of unfavorable information in the official personnel files of individual soldiers, for assuring that unsupported or unresolved unfavorable information is not filed in the official personnel files, and for assuring that the best interests both of the Army and the individual are served by placing unfavorable information in official personnel files and, where appropriate, removing it.

This revision of AR 600-37 is another of several steps taken by the Army Staff to decentralize decision authority for various personnel actions. Under this revision, local commanders have the authority to issue letters of reprimand, admonition, or censure and direct their filing in the Military Personnel Records Jacket (MPRJ) without referral to and review by a higher authority. Consequently, their decisions must strike a proper balance between the Army's need for information and the protection of the rights of the individual soldier. In this regard, the authority to direct the filing of letters of reprimand, admonition, or censure in the MPRJ will be restricted to the following:

•*Enlisted personnel*. General officers and officers exercising general court-martial jurisdiction, or the soldier's immediate commander or higher level commander in the chain of command.

•*Commissioned and warrant officers*. General officers, general court-martial authorities, immediate or higher level commanders, plus the officer's rater, intermediate rater, and senior rater designated in accordance with AR 623-105, Officer Evaluation Reporting System.

A summary of the more significant changes included in the revision of AR 600-37 follows:

•There is no requirement for all letters of reprimand, admonition, or censure to be reviewed by a general officer. Such letters are to be forwarded to a general officer for review only if the person initiating the letter recommends that it be filed in the Official Military Personnel File (OMPF).

•The basis for appealing for removal of a letter of reprimand, admonition, or censure from the OMPF is now expanded. AR 600-37 authorizes removal of such letters from the OMPF performance fiche when an individual can substantiate that "justice" or the "intended purpose of the letter" has been served. Letters successfully appealed under this authority will be transferred to the restricted fiche of the OMPF. (The performance fiche of the OMPF is the primary file for performance data which is used for evaluation and selection by DA Boards and career managers. The restricted fiche is a protected file containing those documents which must be permanently retained to facilitate personnel administration and/or protect the interests of the government and the individual but, because of regulatory or policy requirements, will not be released to selection boards or career managers without special authority.)

•Authority to direct removal of letters of reprimand, admonition, or censure from the MPRJ prior to their specified expiration date is now expanded to include the commander or rating official who issued the letter, or a higher commander or supervisor. Under previous AR 600-37, such authority rested solely with the officer exercising general court-martial jurisdiction over the individual.

•Upon approval of a change in status from enlisted to commissioned or warrant officer, letters of reprimand, admonition, or censure received while in an enlisted status and, which are filed in the performance portion of the OMPF, will be moved to the restricted portion of the OMPF. Those letters filed in the individual's MPRJ will be removed and destroyed or returned to the individual. Officers and warrant officers, who as prior enlisted soldiers received such letters prior to the effective date of the revised AR 600-36, may submit an individual request for transfer of the letter to the restricted fiche.

Commanders Update

LTC Bernard J. Mogan
1st Battalion, 15th Field Artillery

LTC Lewis I. Jeffries
1st Battalion, 19th Field Artillery

LTC Max W. Johnson
1st Battalion, 32d Field Artillery

LTC Richard H. Sinnreich
6th Battalion, 37th Field Artillery

LTC Patrick D. Conner
1st Battalion, 78th Field Artillery

LTC Thomas E. Swain
3d Battalion, 319th Field Artillery

LTC Michael R. Cook
552d Group

LTC Frelen J. Rhoadarmer
1st Cannon Training Battalion
US Army Field Artillery Training Center
Fort Sill, OK

LTC Guy Zimmerman
Staff and Faculty Battalion
Field Artillery School Brigade
Fort Sill, OK

Mannin' the Cannon

MOS Structure Problems in the Field Artillery

by CPT Gary Waxmonsky

Should the Army just promote soldiers to fill the vacancies? Unfortunately, promotion itself is not the solution to the problem.

Similar to personnel problems now surfacing in other branches, the Field Artillery is currently experiencing a severe shortage of noncommissioned officers (NCOs). Understandably, this situation has seriously affected the morale of serving NCOs by creating repetitive assignments, requiring certain individuals to "fill in" the next higher grade without the pay, and subjecting many to faster turn around time for overseas levies.

Under these conditions, our noncommissioned officers cannot attain career growth, since tour stabilization and opportunities for promotion to the next higher grade have been considerably lessened. Additionally, rapid turnover and its attendant problems lessen family stability and tend to discourage the NCO to serve beyond 20 years. The obvious result is many choose early retirement.

Perhaps the best example to illustrate the grade imbalance in the Field Artillery is to take a quick look at MOS 13B (cannon crewman) since at least 50 percent of all Field Artillery soldiers are assigned this military occupational specialty. Currently, there is a serious shortage of 13B noncommissioned officers in grades E5 and E7 which lessens the opportunity for promotion to the next higher grade. Additionally, there are far too many E4s to compete for promotion to E5

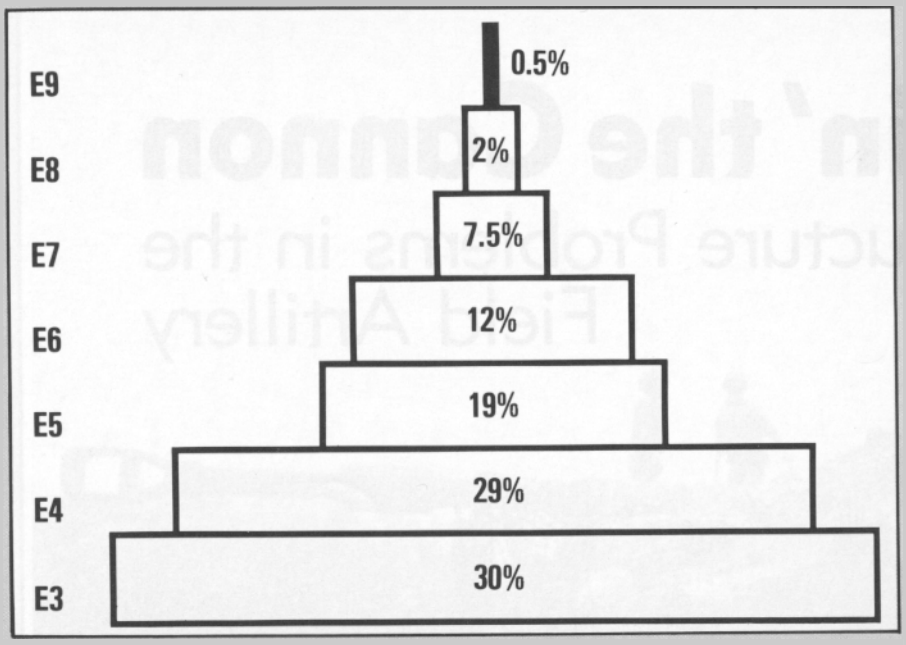


Figure 1: Optimal CMF structure (grades E3 through E9).

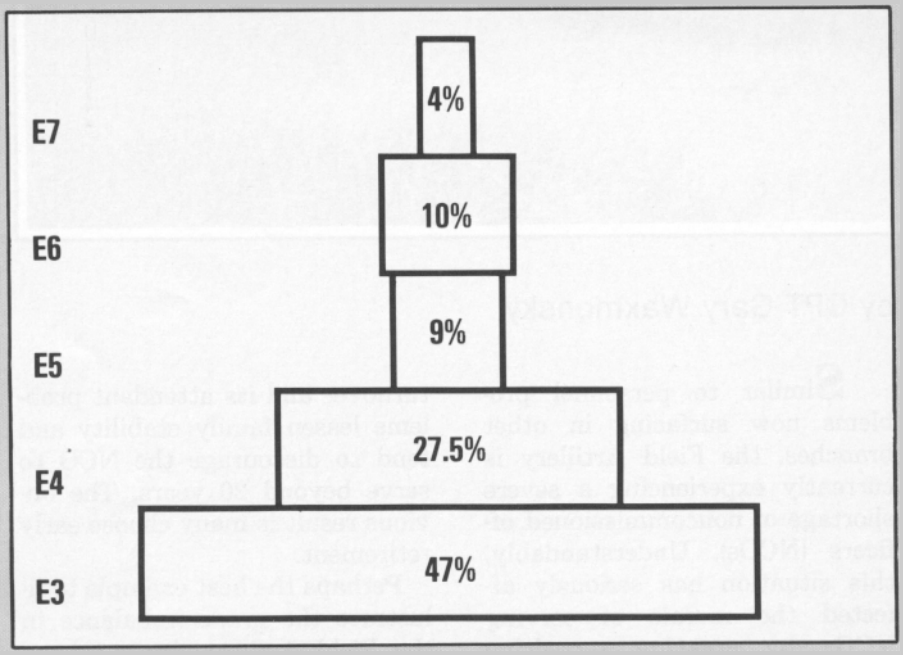


Figure 2: Current MOS 13B structure (grades E3 through E7).

which certainly influences the young soldier who is deciding whether or not to make the Army his career.

What is the solution? Should the Army just promote soldiers to fill the vacancies? Unfortunately, promotion itself is not the solution to the problem. Contrary to popular opinion, existing vacancies alone do not guarantee promotion; the grade structure or "base" is actually the determining factor.

A graphical picture of the Field Artillery force can be illustrated by a force structure pyramid, where each horizontal grade segment (or base) is wider than the segment above it. Figure 1 represents the ideally structured Field Artillery force, with each level of the pyramid representing the percentage of the force authorized in that particular grade as compared with other grades in the MOS. Obviously, there should be more private first class slots than sergeant major slots. In fact, in order for an MOS to be self-sustaining — to provide the best opportunity for the career soldier to progress from private first class to sergeant major within his chosen CMF — the structure should approximate the percentages shown in figure 1. That is, there should be proportionally less positions in each grade as a soldier moves higher up the pyramid. That way, the most qualified and highly motivated individual will be able to move smoothly up the grade pyramid, while a percentage of the remainder either leave the service or are reclassified into a different MOS.

Here is the nub of the problem. The operational requirements which determine the number of soldiers required in each grade do not necessarily lead to an MOS structure which permits optimal career progression. Again, the grade authorizations for MOS 13B provide a good case in point. Figure 2 shows a bottom-heavy MOS structure with nearly half of the authorizations at grade E3 and with more individuals in grade E6 (staff sergeants) than in E5 (sergeants). This arrangement reflects the real-world situation in artillery batteries and sections and shows that there is a serious imbalance in the MOS 13B grade structure. From a personnel management standpoint, the smaller number of E5s creates a defective structure in which promotions from grade E3 to E4 and from E4 to E5 are constrained by the bottleneck which exists at

grade E5. Here, too many are competing for too few spaces, which means that most 13B PFCs and SP4s are promoted more slowly than their peers in other MOSs. At the same time, the fact that more staff sergeants are required than sergeants means that those soldiers who do make grade E5 tend to be promoted quickly to staff sergeant with minimal time in grade and, perhaps, below-average qualifications. In the first case, the result is delayed promotions, frustration, and possible high attrition. The second example would result in high turnover in grade E5 and perhaps promotion of some marginally qualified individuals. Both trends have an adverse impact on unit morale and mission performance.

Problems such as these are known as "MOS infeasibilities." The introduction onto the battlefield of new technologies and advanced weapon systems often requires changes in the way units are organized and manned. These changes, in turn, must be evaluated in terms of their effects on the manning posture (the ratio of "faces" to "spaces") within the particular MOS or Career Management Field.

Such a study, focusing on the Field Artillery Branch and CMF 13, is presently underway at the US Army Field Artillery School and Center with assistance being provided by the Enlisted Personnel Management Directorate at the US Military Personnel Center (MILPERCEN). A task force at Fort Sill is examining grade imbalances within the four Field Artillery MOSs which can be restructured through internal force trade-offs—13B (cannon crewman), 13F (fire support specialist), 15D (Lance missile crew member), and 15J (Lance fire direction specialist). The goal of the task force is to restructure these four MOSs — nearly three-fourths of all personnel in CMF 13 — by the end of September 1981.

This is no simple project. The Field Artillery is in the process of absorbing major technological innovations such as more sophisticated ammunition, higher rates of fire, TACFIRE, and the Multiple Launch Rocket System (MLRS). Force structure planners at Fort Sill must also take into account unit reorganizations envisioned as part of the "Division '86" program. The Field Artillery Career Management Field has more MOSs than any other combat arm and more authorized spaces than any combat arm except infantry. All these factors lend considerable complexity to the task of MOS restructuring.

Some of the changes in MOS 13B currently under consideration are:

•Addition of a second E5 position in each firing section (to serve as ammunition team chief).

•Upgrading all ammunition section chiefs to E6.

•Additional E5s in the ammunition section.

•Four E7 positions in each Division '86 firing battery.

These modifications would bring sergeant E5 authorizations up from about 9 percent (figure 2) to approximately 17 percent of the total force. Sergeant first class positions would rise from about 3½ percent to more than 5 percent of total MOS authorizations after implementation of Division '86. These increments would be partially offset by corresponding decreases in E3 and E4 spaces. The entire plan would move MOS 13B much closer to the self-sustaining pyramidal configuration in figure 1 and would specifically help offset the shortage of master sergeants by augmenting the pool of eligible sergeants first class.

Using a specially designed computer model, MILPERCEN has devised a structure for CMF 13 which would maximize promotion potential and sustain personnel strength up to the grade of sergeant major. In MOS 13B, the model recommends a severe (about 17 percent) cut in positions at grade E3 and below, together with substantial increases in authorizations at grades E4 and E5 and a smaller increase at grade E7. Except for the additional E7s, this plan would eliminate the imbalances in MOS 13B through grade trade-offs within current force strengths. Additional spaces cost money and require Congressional approval. (Some additional expenditures would be involved, of course, in meeting the higher salaries of SP4s and SGTs as compared with privates and PFCs.)

MILPERCEN, however, can only propose the general direction which the restructuring effort should take. The CMF 13 Task Force at Fort Sill will recommend proposals to correct the current structure problems of Field Artillery MOSs. As the study proceeds, MILPERCEN will work with the task force to meet both the demands of operational readiness and an optimal force structure.

Readers' suggestions and comments concerning this process are encouraged and should be addressed to:

Commander, MILPERCEN
ATTN: DAPC-EPK-A
(MSG Ulm)
2461 Eisenhower Drive
Alexandria, VA 22331

CPT Gary Waxmonsky, USAR, is currently a member of the Individual Ready Reserve.

With Our Comrades In Arms

notes from other branches and services

High-mobility multipurpose wheeled vehicle

On 1 July this year, the US Army Tank-Automotive Research and Development Command (TACOM) awarded separate contracts to AM General, Teledyne, and Chrysler for production of prototypes of the Army's new high-mobility multipurpose wheeled vehicle (HMMWV).

Planned for introduction in December 1983, the HMMWV is a light, highly mobile vehicle consisting of a 1¼-ton common chassis that uses different body designs for specific roles. It will replace the M274 ½-ton Mule, the M561 1¼-ton Gama Goat, and the M792 ambulance. Additionally, it will selectively replace M151 ¼-ton trucks and M880 1¼-ton commercial utility cargo trucks now serving in combat and combat support roles.

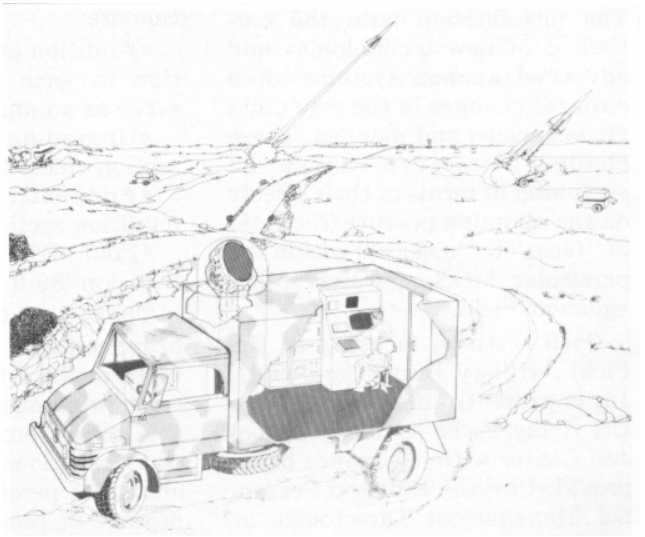
Announcement of the contract awards comes following an evaluation of proposed vehicle designs submitted by AM General, Teledyne, Chrysler and two other competitors in response to a TACOM request last February.

Melvin R. Burcz, Acting Chief of Tactical Wheeled Vehicle Division in TACOM's Research and Development Center, said that under terms of the agreement, the firms will each deliver prototypes within 10 months. Then, following five months of vehicle testing, one of the competing companies will be awarded a five-year contract for production of approximately 15,000 HMMWVs. If these first vehicles prove to be a success, the Army expects to buy substantially larger quantities in the future to fill its own needs, as well as the needs of the Marine Corps and Air Force.

The HMMWV will be used in forward areas, where a high-mobility capability is essential. It will be capable of performing a variety of joint service roles — serving as a weapons carrier, communications center, cargo and personnel utility carrier, TOW missile carrier, and reconnaissance vehicle. Since the HMMWV will be operating in forward areas, it will feature run-flat tires and ballistic protection up to 16-grain fragments traveling at 425 meters per second. Some models will also have explosion-proof fuel tanks.

The HMMWV will be diesel-powered and have an automatic transmission. It will carry a 2,500-pound payload, have a cruising range of 200 miles, accelerate from 0 to 30 miles per hour within 6 to 8 seconds, and achieve a maximum speed of 60 miles per hour.

Acquisition of the HMMWV will not only provide the Army with an expanded mobility capability in the ¼ to 1¼-ton segment of the tactical fleet, but it will also help alleviate the critical vehicle shortage that presently exists. The Army anticipates a need for more than 112,000 HMMWV's to replace current aging vehicles in the ¼- to 1¼-ton category.



FLEXAR MOBILE HAWK—A new application for the FLEXAR fire control system proposes a nearly fourfold increase in firepower for the Improved Hawk air defense network. FLEXAR Mobile Hawk's electronically scanned agile beam antenna and multi-mode transmitter/receiver (capable of processing a wide variety of waveforms) enable the functions of both a search radar and a tracking/continuous wave illuminator radar to be combined into one mobile van, which also serves as the Hawk fire unit's command post. This consolidation will reduce manpower and equipment requirements by as much as 50 percent and will also provide greater mobility. FLEXAR prototype hardware, developed and built by the Radar Systems Group of Hughes Aircraft Company under contract from the US Navy, proved its ability to track multiple targets while continuously scanning for others during test evaluations at the Pacific Missile Test Center.

Ground sensor system fielded

The first ground sensor system designed to sound an alarm of an approaching enemy, the Platoon Early Warning System (PEWS), was fielded in late May by the US Army Electronics Research and Development Command (ERADCOM). Fielded to the 197th Infantry Brigade at Fort Benning, GA, the system is intended for platoon, squad, and patrol-size tactical units.

Weighing only 22 pounds, the system consists of 10 seismic-magnetic sensors, two radio receivers, two wire links, virtually invisible ground rods or antennas, two headsets, and two carrying cases.

Ten detectors buried in small holes (4x7x2 inches) can detect movement within a radius of 10 meters. These detectors are virtually invisible. Signals are transmitted either by wire connecting the detectors or by radio frequency through a camouflaged antenna built into the unit. They transmit to either of the two hand-held receivers.

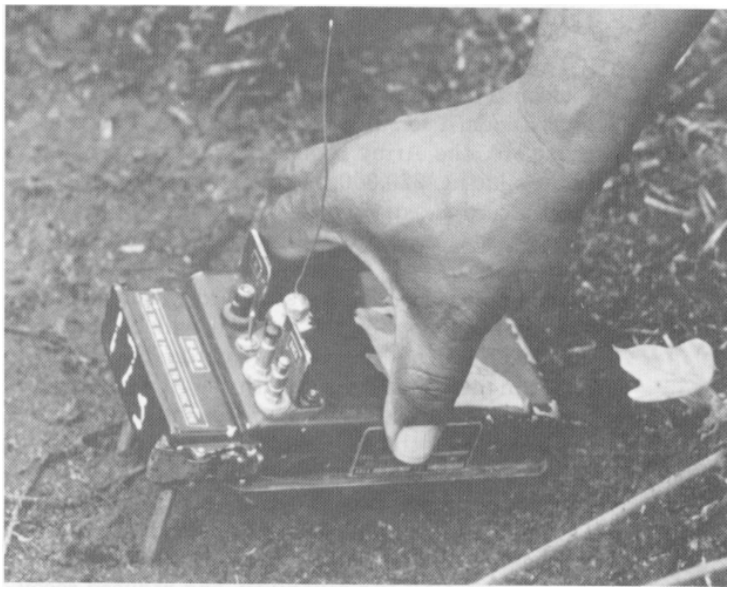
For the soldier who is manning a lonely outpost or for one away from his position, PEWS is equipped with small, lightweight flat earphones that fit under his helmet. The beeping signal is loud enough to alert or wake anyone manning the receiver. Like a human ear, the electronic alarm has an "instinctive ability to tune out background noise and hear what it needs to hear," according to the PEWS assistant project manager.

The detectors are expendable and are powered by nine-volt batteries. Good for at least two weeks, they are left behind when the patrol or squad moves on. When the sensor is activated, numbers followed by P (for personnel) or V (for vehicle) appear on the receiver. Used in combination, these numbers pinpoint the location or source of the activation. As each activated sensor lights up the screen on the receiver, a pattern of movement emerges from the monitoring device.

This early warning and detection system requires only eight hours of training for the user.

The production contract for PEWS with International Signal and Control Corp., Lancaster, PA, calls for 4,000 systems to be fielded worldwide during the next two years. Primarily intended for the Infantry, it will also go to the Arillery and Armor branches.

PEWS is also a prime example of Army-developed technology directly transferable to the civilian world and other government agencies. Especially effective in border patrol, PEWS has been used with extraordinary success by the Department of Justice's Imigration and Naturalization Service to monitor illegal border crossings.



Platoon Early Warning System.

T700 helicopter engine

The General Electric T700 helicopter engine used in the Army's BLACK HAWK combat/utility helicopter is one of the best engines ever built according to COL Ronald K. Andreson, the BLACK HAWK Helicopter Project Manager. "The T700 is one of the most successful engines developed for use in the Army helicopter and is a significant part of the Army Aviation Program. The T700, in less than 100,000 hours of BLACK HAWK operation," Andreson explained, "established a level of maturity that traditionally has not been achieved by an engine until it reached the one-millionth hour operating mark."

The T700-powered BLACK HAWK helicopter demonstrated its reliability and maturity participating in a special Rapid Deployment of Forces (RDF) exercise held in Egypt this past winter. Fourteen BLACK HAWKS accumulated nearly 80 hours of flight time in a single day in a sand-saturated environment. The aircraft made more than 1,200 landings during the exercise and as many as 20 per hour. No engine or accessory changes were required. The RDF exercise was a demonstration of the rapid extension of airmobile forces over long distances by the Army's 101st Airborne Division.

To date, the T700 has accumulated more than 130,000 hours of operation, including 30,000 hours at the factory and nearly 108,000 hours in the field, spanning the entire range of temperature extremes and environmental exposure — from Alaska to Egypt.

Bids open for new handgun

In July this year, the Department of the Army took initial action toward making the 9-mm handgun standard for all military services. Designated the XM9, the Army requested contract proposals for producing 220,000 of the new weapon. A contract award is expected by January next year.

The 9-mm handgun will replace the M1911A .45 caliber pistol and .38 caliber revolver now in use; 9-mm ammunition is now standard within NATO.

Initial delivery of the weapon will be made in mid-1982 to the US Coast Guard. The planned phase-in period is 10 years with the Army being the last service to receive the new weapon.

This will be the first time that the military services will have a single, standardized, common-purpose handgun. It is also the first major change in US military handguns in more than 50 years.

The weapon's advantages include reduced weight, improved safety and reliability, and reduced recoil. Also, it has a higher hit probability and double-action firing.

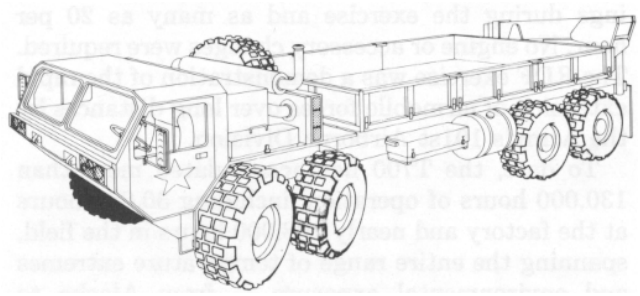
Army buys new 10-ton truck

On May 22 this year, the US Army Tank-Automotive Research and Development Command (TACOM) awarded a $251,130,318 5-year contract to Oshkosh Truck Corporation for production of the Army's new 10-ton truck — the heavy expanded mobility tactical truck (HEMTT).

Designated the M977, the HEMTT is designed to provide cross-country mobility and will supplement the current 8-ton M520 Goer truck family.

Introduced in 1973, the Goer is an excellent off-road vehicle—having both the capability of swimming and operating on rough surfaces—but it is not very suitable for use on paved highways. The HEMTT is an 8x8 design that performs well both on and off the road.

Under terms of the production contract, the Army will receive the first 250 HEMTTs (at a cost of $31,725,049) this year and a total of 2,140 vehicles during the five-year life of the agreement. The contract also contains production options that allow the Army to buy an additional 5,350 vehicles.



Artist's concept of the heavy expanded mobility tactical truck.

The HEMTT includes two cargo versions, a petroleum tanker, tractor and wrecker. It features extensive use of commercial automotive components. For example, it uses a standard truck cab, a standard 8-cylinder diesel engine which develops 400 horsepower, and a 5-speed automatic transmission.

Also featured is a side-mounted winch which permits recovery operations from either the front or rear of the vehicle (a first for US Army tactical trucks), a commercial crane which provides a self-loading and unloading capability, and radial-ply tires for improved highway and cross-country performance.

The truck has a cruising range of 500 miles and a maximum highway speed of 55 miles per hour. It has a payload capacity of 22,000 pounds.

Dennis Mazurek, HEMTT project enginer in TACOM's Research and Development Center, pointed out that, unlike the Goer, the new truck is unable to swim but can ford water up to 48 inches deep. "In order to meet the objecties of using commercial components to the maximum extent possible," Mazurek explained, "it was necessary to give up the swimming capability. Since no commercial truck user has a requirement for a vehicle that can swim, commercial components are simply not designed for this purpose."

The first HEMTTs are expected to be fielded in late 1982.

Ordnance Hall of Fame

Nominations for the 1982 Ordnance Hall of Fame are now being accepted by the Ordnance Center and School, Aberdeen Proving Ground, MD.

The Ordnance Hall of Fame honors those who have made significant contributions which advanced the cause and mission of the Ordnance Corps or who have been awarded the Congressional Medal of Honor while assigned to the Ordnance Branch. Six individuals are normally inducted each year.

Nominations are open to retired or deceased individuals, both military and civilian, and must include documented information on the individual's contributions and as much background material as possible. The closing date for 1982 nominations is January 15. Nominations should be sent to:

Commanding General
US Army Ordnance Center and School
ATTN: ATSL-DOSM
Aberdeen Proving Ground, MD 21005

Air Defense Cost Study

The Directorate of Combat Developments, US Army Air Defense School, Fort Bliss, TX, has recently published the 1981 Edition of the US Army Air Defense Cost Study — 1980s. Data developed during the study's progress has been used by HQDA to optimize the cost of the US Army Air Defense Force improvement programs for the 1982 budget and to support the long-range air defense force modernization program that was recently presented to Congress.

The study defines the air defense force budgeted in March 1981 and describes both the cost and nature of 22 air defense system program alternatives considered in arriving at the budgeted force.

The study is classified SECRET-NOFORN. Copies may be obtained from the Security Office (ATSA-CDP-S), Directorate of Combat Developments, by interested personnel having an appropriate security clearance and a "need to know" justification.

RDJTF slated for separate command status

The Secretary of Defense recently announced that over a period of three to five years the Rapid Deployment Joint Task Force (RDJTF) should evolve into a separate unified command — with its own geographic responsibilities, service components, forces, intelligence, communications, logistics facilities, and other support elements.

During the short time of the RDJTF's existence, considerable progress has reportedly been made in improving the US strategic posture in Southwest Asia; detailed, joint contingency planning has been undertaken; service force and support requirements have been identified; joint exercises of rapid deployment forces of all four of military services have been conducted — some in combination with the forces of other nations in the region; and significant equipment has been pre-positioned to increase the speed with which forces can be deployed.

However, more is needed to increase its power projection capability, including enhanced sealift and airlift, further pre-positioning, improved facilities, and greater sustaining capability. The Administration's recent force structuring initiatives represent significant steps toward speeding progress.

As US capabilities grow, however, the structure of the RDJTF must reportedly grow to keep pace. The first change the Secretary of Defense will direct in the RDJTF's organization will be the assignment of XVIII Airborne Corps and, shortly, other units to strengthen the RDJTF, its service components, and combat units. This will permit better deployability and sustainability of forces in Southwest Asia. Other changes will come later as additional resources become available for the command.

For the time being, relationships among the present unified commands will not change, nor will the RDJTF's mission change. The RDJTF headquarters will continue to be located at MacDill Air Force Base, FL, and it will continue to have a potential for worldwide deployment, but its major focus will remain on Southwest Asia.

Further details concerning evolution of the RDJTF—such as specifics and timing of changes, other forces assigned, headquarters size, and functional responsibilities—will be announced in the future as political military developments permit. *(Army RD&A* magazine)

AMRAAM LAUNCHED—Initial launch of an Air Force/Navy advanced medium-range air-to-air missile (AMRAAM) from an F-16 was recently performed successfully at the White Sands Missile Range, NM. The first of three photographs (top) shows the missile as it starts to move forward on the launcher rail. "Mach diamonds" appear in the exhaust plume as its velocity reaches supersonic speed. The missile leaves the launcher rail in the second photo, and, in the third, smoothly passes through the aircraft's aerial wake. The launch demonstrated not only the smooth flight characteristics of the Hughes Aircraft missile, but also verified the aircraft/launcher interface and the function of the launcher. (US Air Force photographs by TSgt Alan M. Lochner.)

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Yorktown

During the week of 15-19 October 1981, America will pay tribute to the valiant soldiers of the Yorktown victory with a 200th anniversary celebration. Events will include: reenactment of the seige including firing of 40 cannon and 2,000 muskets, fife and drum demonstrations, military and naval reviews, concerts, a Bicentennial Fair Exhibit, fireworks, and a final reenactment of the surrender ceremony. Artillerymen can be justly proud of the key role their forerunners played in a battle which virtually assured the final American victory in the revolution. Those that are able to attend the anniversary activities in Yorktown are sure to come away with a feeling of pride and accomplishment as they continue in the rich traditions of the Field Artillery.