Field Artillery Journal

January–February 1985

LIVE TO TELL ABOUT IT

Field Artillery Journal

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ARTICLES

FEATURES

Cover photo by Sam Orr

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PURPOSE (as stated in the first *Field Artillery Journal* in 1911): *"To publish a journal for disseminating professional knowledge and furnishing information as to the field artillery's progress, development, and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country."*

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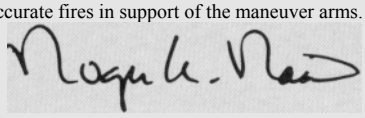
Recently Mr. John McMahon visited Fort Sill to make a presentation to the staff of your *Field Artillery Journal*. Mr. McMahon, who steered a forward observer's tank across Europe during World War II and who later became the first president of the 112th Field Artillery Association, is no stranger to the readers of the *Journal*. His frequent, insightful contributions including articles, letters, and poems have delighted artillerymen around the world, but the words inscribed on the artillery red plaque which he presented to the *Journal* were a particularly poignant submission. They captured the very essence of your *Journal's* job:

Preserving our past
Explaining our present
Assuring the future

This issue of the *Journal* delivers exactly what Mr. McMahon enjoins us to provide; it marches down the road of time and examines how yesterday's Redlegs survived and how tomorrow's gunners must operate if they are to "live to tell about it." CPT John Gordon and SFC Charles C. Sharp begin this trek through time. In their provocative historical commentaries, they preserve the survivability lessons learned by the artillerymen of yesteryear. CPT Scott Gourley, Mr. Bert Brown, and CPT George T. Norris, Jr., step forward into the present as they explain many of the most troublesome aspects of today's Threat. Then a group of innovative authors including COL Robert Adair, MAJ Thomas Grodecki, CPT Thomas E. Hill, CPT Robert D. Lewis, CPT Robert E. Haglin, and SGT Ward Wright leap boldly into the future as they present practical recommendations designed to assure that tomorrow's fire supporters will survive an ever-growing Threat.

This issue of the Army's journal of fire support meets an old Redleg's challenge. It exploits the lessons of the past and the competence of the present to help future battle captains and their supporting gunners "survive the Threat." It provides the knowledge that will help us not only "to live to tell about it" but also to achieve our unalterable mission—delivering responsive, accurate fires in support of the maneuver arms.



EDITOR

On the Move

MG JOHN S. CROSBY

Only by developing the capability to command and control the entire fire support system can we provide timely and accurate fire support when and where the maneuver commander wants it.

Over the past few years we have grappled with the problems of command, control, and communications (C^3) on the AirLand Battlefield. Following the lead of the Combined Arms Center (CAC), we and the other TRADOC schools are seeking to standardize command and control (C^2) systems and to improve combat communications.

Today, technology provides us a rapidly expanding capability to move information across the battlefield. But moving information is only a small part of the Army's requirement. To be useful, the information must be screened, evaluated, and put into a form that aids the decision process. All this must be done quickly in order to allow commanders to make crucial decisions before their enemy counterparts can make theirs. Acquiring, processing, and exploiting information may well be the key to gaining and maintaining the initiative on tomorrow's battlefield.

Over the years there have been several attempts to standardize C^2 at corps, division, and brigade levels; however, in each instance, commanders found that the proposed standard system failed to meet their personal needs. There are, nevertheless, a number of requirements that virtually all commanders did recognize and accept. These standard functional requirements normally are performed by staffs in command posts and are the Army's main area of focus for its C^2 standardization efforts.

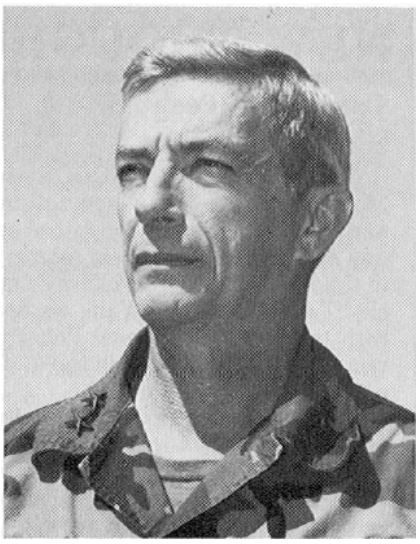
The Command, Control, Communications, and Intelligence (C^3I) Directorate at Fort Leavenworth has looked at each echelon of command and identified certain common elements of information that are needed for the commander to make decisions. CAC has also produced a series of formats which concisely depict that critical information. These procedures provide massive amounts of information through a series of decision graphics.

To move this massive amount of information, commanders and their staffs require a digital communications system. TACFIRE is the only digital system in the Army today. The maneuver arms are now following our example and are developing their own control system, as is the intelligence community with its all-source analysis system. Once fielded, these systems will share critical information and move it quickly around the battlefield. Concurrently, Army communicators are pushing ahead with a new area communication network. This system, commonly called the mobile subscriber equipment (MSE), will provide easy access for all commanders from battalion up through corps. MSE will provide access points where units can electronically be patched through a redundant, decentralized system that will route communications to designated receivers. Furthermore, the system will accommodate the "friction" of battle. Nodes may be destroyed and other nodes may be on the move, but the MSE system will continue to handle and route the digital and voice traffic.

The Field Artillery Community is playing a crucial role in the development of a standardized C^3I system because we operate at each echelon of command. From the fire support team at company level to the battle coordination element at corps, field artillerymen must provide responsive fire support. To do that, the fire support system must receive, process, correlate, and format all types of tactical information.

TACFIRE is currently the command and control system used to do that mission. Although it has proved extremely useful, TACFIRE is also a manpower and training intensive system. Today's TACFIRE units pay a significant price to sustain this capability. The training base, forced to operate at maximum capacity, is also strained.

The field artillery is applying the valuable technical lessons learned from its experience with TACFIRE to the development of the follow-on system, the Advanced Field Artillery Tactical Data System (AFATDS). AFATDS will be a state-of-the-art digital *fire support* command and control system and not merely a *field artillery* command and control system, as TACFIRE is. AFATDS



will appear in the fire support element (FSE) at every echelon—company through corps—and will give the maneuver commander the immediate capability to influence the battle through fire support. One of the most valuable lessons learned from TACFIRE is that software is the key to an effective and efficient system. Therefore, we are developing the software for AFATDS first. Once the software has been written, tested, and debugged, we will buy the most current hardware to run it. A second lesson from our TACFIRE experience has been the critical nature of the man-machine interface. We will produce user-friendly software for AFATDS that will cut down on initial and sustainment training, maintenance, and resource requirements.

We are also working hard to produce a quality Light Field Artillery Tactical Data System (LFATDS) to replace TACFIRE in the light divisions. Depending on the success of tests to be conducted in the fall of 1985 by the 9th Infantry Division (Motorized) at Fort Lewis, LFATDS could be contracted and fielded in all light infantry divisions in the near term.

The field artillery continues to be in the vanguard of the development of automated and standardized C^2 systems. We must continue to forge ahead and at the same time maintain complete integration with the other key players in the command and control arena. Only by developing the capability to command and control the entire fire support system can we provide timely and accurate fire support when and where the maneuver commander wants it.

Incoming

LETTERS TO THE EDITOR

NEW THOUGHTS ON OLD ISSUES

Taking the Tech

As members of the TRADOC System Manager's Office chartered to study and develop programs for future cannon systems, we were most interested in Colonel Anthony G. Pokorny's article "Take the Tech." While we agree with the thrust of Colonel Pokorny's remarks on cannon artillery, a few points require elaboration.

The Division Support Weapon System Special Study Group (SSG) evaluated the use of existing state-of-the-art technologies for cannon applications and compared the effectiveness of an entirely new system with the SP-70 and the M109 with both maxi- and mini-product improvements. The results showed no significant difference in the relative effectiveness of any of these options; but, when costs were compared, the case for a product improvement to the M109 became obvious.

As a former Director of Analysis at TRADOC, Colonel Pokorny can appreciate the importance as well as the limitations of proving your case by using models and simulations. The SSG's modeling efforts, as recorded in the HIP Cost and Operational Effectiveness Analysis, showed dramatic payoffs when adding the HIP items to our M109 fleet—especially when viewed in terms of cost effectiveness. The graph in figure 1 summarizes the SSG's findings. Thus, the USAFAS recommendation to the senior Army leadership calls for including three packages of product improvements for the M109.

- The semi-autonomous operations package, which allows dispersed howitzer positioning, includes an automatic gun positioning system (AGPS) and a radio with a range of 20 kilometers or more, along with an on-board processor and gun drive servos.

- The RAM/range package includes a new cannon, mount, modular recoil, and auto-priming armament system; new electrical and hydraulic systems; and automotive improvements, along with the latest generation of test, measurement, and disgnostic equipment. In addition to the capability for achieving a 30-kilometer range with rocket-assisted projectiles, engineering estimates project a 50 percent improvement in the M109's wartime operational availability when the RAM/range package is added to the M109A2/A3.

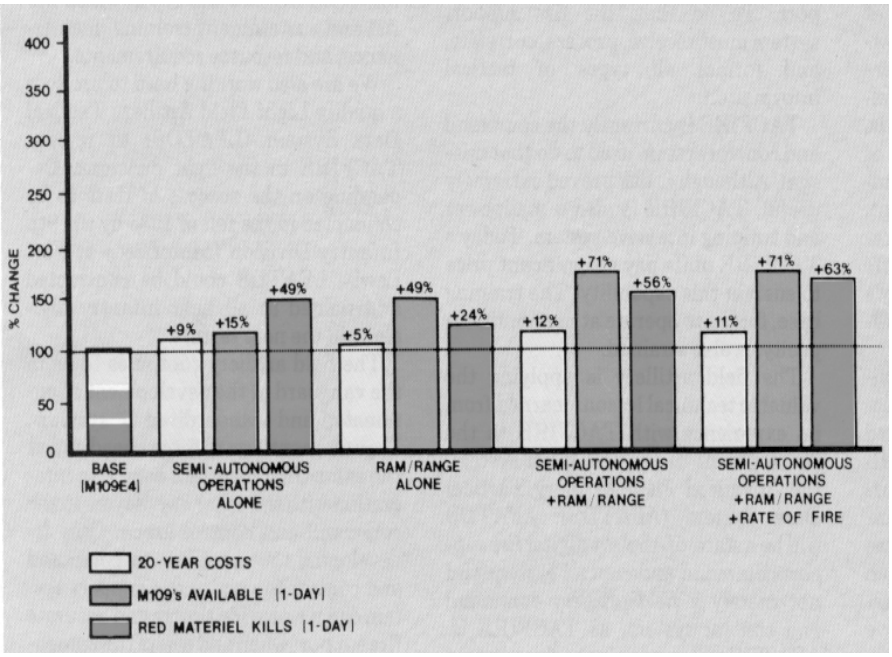


Figure 1. Comparison of HIP costs and benefits.

- The third package calls for a mechanical loader assist which provides a burst rate of fire and automatic fuze setter.

True, the HIP howitzer will not totally automate M109 loading and firing operations; however, the combination of the loader assist, fuze setter, autoprimer, on-board processor, AGPS, radio, and gun-drive servos will reduce the labor required for operating the M109. Think of it—in the HIP world there is no requirement for aiming circles, collimators, wire lines, or even manually traversing and elevating the gun tube.

For the future we are evaluating a broad range of technologies to adapt for our follow-on to the M109. Robotics, liquid propellants, unicharges, and electromagnetic launch are ongoing Army research and development programs. In the development of new technologies, the free market US economy also serves our interests by encouraging the competition of industries pursuing these technologies, some of which will be useful for cannon artillery applications. Students of national security appreciate that "security" is a relative term. As new technologies become available, the users must continue to refine and articulate artillery requirements to ensure that we develop weapons systems to counter the threat while developing programs for follow-on systems that allow us to leap ahead of that threat in the future. Obviously, we cannot afford everything in the tech base, but we can assure Colonel Pokorny of two things. First, our HIP proposal is the most cost-effective approach for the near term; and, second, we at USAFAS are actively involved with Army Material Command labs and industry in evaluating new technologies for our "leap ahead" system prior to the year 2000.

Chris Herrick
LTC, FA
Jeff Boucher
MAJ, FA
Joe Cerami
MAJ, FA
John Traynham
MAJ, FA
Fort Sill, OK

Concentrate on the present

Many artillerymen appreciate the seriousness of the times and they take solace in the statement, "the future looks brighter." I say, "Let us concentrate on the present."

In Europe, the Soviets have already deployed a family of surface-to-surface missilery—the second generation SS-21, SS-22, and SS-23. These highly accurate systems incorporate conventional warheads. In range, the Soviets *blanket* NATO forces so that even the rear-most air bases are now at risk to conventional attack. Soviet doctrine states, "The strategic and tactical missile forces are the basis of the firepower of the land forces for defeating their enemy."

In the Middle East, our Navy stationed a battleship off the coast of Beirut and shelled certain areas using World War II shells with questionable spotting. In answer, the Soviets have now stationed missile units in Syria. If our Navy returns, it will be blown out of the water.

We have just begun jointly with our Allies to deploy our multiple launch rocket system with its present 30-kilometer range which is suitable for support of units in contact. General Rogers (SACEUR), Senator Sam Nunn, and others have been pleading for more than two years for a "credible conventional component" to "raise the nuclear threshold." The principal ground fire asset in this program will be the guided missile. This is the artillery's responsibility! To answer, we must immediately initiate a program of missiles! The MLRS is only a starter. On-the-shelf technology is available. In range, these missiles must reach the Warsaw Pact's rearmost installations. In caliber, they must handle all of the smart submunitions now available. The Vought 22-inch missile is an example. In number, one analyst says we need 3,000 for the European front plus 2,000 air-delivered missiles. Congress is ahead of the Army on missile thinking; so the money is no problem.

In the multispectral field of sensors, there is a continuous explosion. Present and future eyes of the field artillery must be fully exploited.

Developed smart submunitions are already available in Europe and the US; these must be acquired and further development pursued.

Further improvement of the M102 105-mm howitzer is not sound—it should be put in the museum as the outstanding field piece of the Vietnam era alongside the French 75 of World War I. Both our light forces and the Marines have long needed a modern field piece; take a look at the Soviet 122-mm self-propelled howitzer, ASU-57 airborne assault gun, and the ASU-85 airborne assault gun. The Soviets are now working on a new high-velocity gun. We need something that is air droppable, amphibious, mobile, and protected and something that has a high rate of fire, high velocity direct or indirect fire, and an all-around traverse with minus 3 to plus 70 degrees elevation capability.

Integration of missilery employment with the Air Force, including the reconstitution of a viable corps artillery headquarters where most of the integration will take place, will require an immense amount of study and effort.

Finally, I come to the statement in the May-June 1984 *Field Artillery Journal*; "The future belongs to the Field Artillery." The hell it does! With apologies to the Smith-Barney commercial, we don't own the future. We can only obtain it the old-fashioned way—we must work for it!

Roland P. Shugg
BG(Ret), USA
Oakland, CA

Beware of fluffy thinkers

Lieutenant Colonel (Retired) Robert S. Riley very clearly lays out the relevant facts concerning crew size of the 155-mm self-propelled howitzer in his article "Fluff or Enough" in the November-December 1984 *Field Artillery Journal*. Technology is available and is being applied to the development of future weapons that will enable a significant crew reduction; however, fielding of that technology is still several years away. Because we must be prepared to go to war today, we must continue our efforts to keep today's decision-makers informed of the intense labor involved in keeping a 155-mm self-propelled howitzer operating 24 hours a day. We must continually guard against that kind of thinking demonstrated by an Under-Secretary of the Army who wondered why the size of a howitzer crew was not the same as that of a tank crew.

John M. Spicer
Fort Sill, OK

Leave the "field" in

I do not agree with Brigadier General Roland P. Shugg's contention (November-December 1984 *Field Artillery Journal*) that we should eliminate "field" from the name of the field artillery.

I feel that the historical connotation of the term "field artillery" is still valid today. This term identifies the artillery organizations that accompany and are part of a force during operations. It does not represent the weapons that occupy fixed positions to defend garrisons or fortresses.

The formation of accompanying field artillery enhances the synchronization of fire support and maneuver operations. We are continually striving to improve this synchronization of effort; let's not take a step backwards.

Furthermore, the difficult question will remain concerning which targets to attack in order to gain the highest payoff. The fact that some field artillery delivery systems may range 150 kilometers beyond the forward line of own troops (FLOT) does not give us the ability to attack and destroy every enemy asset. We do not have the delivery systems or munitions to allow that. Therefore, to answer the question of which target to attack, any force commander and his fire support advisor must have a common understanding of the situation. That common understanding is significantly enhanced when the artillery—field artillery—accompanies the force.

The fact that we may have the capability to acquire and attack targets at extended ranges does not change the fact that we accompany the force and are "field artillery," not a composite branch composed of all types of artillery.

We are called field artillery for good reason; therefore, let's maintain this tradition.

Bob Williams
MAJ, FA
Fort Sill, OK

A sympathetic ear

In response to "Stahl am Ziel" (November-December 1984 *Field Artillery Journal*), I would like to express my sympathy for the communication personnel in both the 72d Field Artillery Brigade and Artillerie Regiment 12. I can well imagine that their technical expertise is stretched to the limit, attempting to satisfy the demands of a mission their equipment was never designed to accomplish. The US Army strives for interoperability in every aspect except training and equipment. Most field manuals make a big issue of complying with STANAGS. Some devote entire chapters to working with our allies; yet very little is done on the nuts and bolts of interoperability. Our equipment apparently was never designed to interface with our allies.

Take this problem 10 to 20 years into the future, and the void becomes more serious. With our recent acquisitions in advanced communications equipment, our allies will feel the strain even more. Imagine the operations officer of a full-fledged, high-tech division artillery equipped with the Advanced Field Artillery Tactical Data System, Position Locating Reference System, Joint Tactical Data System, Mobile Subscriber Equipment, Tactical Satellite, and Single Channel Ground and Airborne Radio System/VANDAL attempting to communicate with allied headquarters. The speed with which these new, high-tech systems communicate will make the job of the liaison officer more important and far more difficult.

Where do we turn for relief? I hope that Staff Sergeant Kenny L. Thompson and Sergeant Jeffery L. Walker pass on their talents for improvisation to the next generation of signal men and women. These young soldiers are going to need all the help they can get.

Harald W. Malloy
SSG, USA
Fort Sill, OK

Expanding a fraternity education

Major Roger A. Rains' excellent article, "Fraternity Education" (November-December 1984 *Field Artillery Journal*) highlights the requirement for US forces to interoperate regularly with our allies.

Another reason for training with our allies, which Major Rains did not point out, is that it allows us to analyze their operational and training methods for our own use. We tend to become stagnant as trainers. We train as we were trained, but looking at these issues in a new perspective can be illuminating. As a lieutenant, I was sent on two missions which made this obvious to me; one as an infantry platoon leader in a Reserve light infantry (Jager) battalion and later in the operations section in the artillery regiment of a *Panzer* division.

There is much to be learned from our allies and much we can teach them, but even more we need to learn to operate with allies, as Major Rains observes.

Jeffrey C. Smith
CPT, FA
Fort Sill, OK

SURVIVABILITY

Executing the defense

Over the last couple of years, there has been increasing concern expressed about the ability of the artillery battery or platoon to defend itself. The *Field Artillery Journal* has had several articles in previous editions dealing with survivability and defensive tactics, and the subject was addressed during the last Senior Field Artillery Commanders' Conference. Field artillerymen need to be practicing what they are forever talking about. The doctrine, tactics, techniques, and procedures are available. All Redlegs need do is execute.

For example, chapter 4 of FM 6-50, *The Field Artillery Cannon Battery*, 25 March 1983, addresses battery defense. This chapter emphasizes the development of a good defensive diagram, the nine basic considerations for the defense, and the reaction force. There is also a table showing the weapons that could be made available to a field artillery battery. Provided unit leaders understand the basic defense considerations and emphasize training of all personnel in battery and platoon defense, a field artillery unit would have a good chance of surviving on the modern battlefield.

Michael R. Pracht
CPT, FA
Fort Sill, OK

More on Soviet artillery

Mr. Brian Loy's letter to the editor, "Soviet Artillery: What is to be Done?" (September-October 1984 *Field Artillery Journal*) highlights recurring concerns over the improvement of the Soviet field artillery. Both he and Captains Scott Gourley and David McDermott ("The Soviet Man of Steel", May-June 1983, *Field Artillery Journal*) have offered valid advice for targeting and countering the massive Soviet field artillery capability. Two important points remain to be discussed, however.

First of all, it is true that the Chief of Rocket Troops and Artillery is a special officer for artillery matters at every level from regiment to front. But he does not do everything himself. He is *not* the artillery commander, although it is recognized that there is an occasional exception at the motorized rifle or tank regiment level. Commanders act as fire support coordinators and are with the maneuver command group, usually at the forward command post.

The Chief of Rocket Troops and Artillery is charged with allocating resources within the constraints of the commander's guidance. The Chief of Rocket Troops and Artillery at division has an artillery command battery to assist him in this function. This battery assigns targets to subordinate units. Most (some sources have said as much as 80 percent) of the ammunition available to a Soviet division will be detailed to various parts of the fire plan. This plan requires extensive scheduling and detailed computations (including the number of rounds to be fired per target) and is computed by the battalion fire direction elements only after the targets have been apportioned by the Chief of Rocket Troops and Artillery and his staff. The command battery also coordinates the massed fires of several battalions since it has communication and fire control authority over the diverse battalions firing in support of a Soviet division.

Secondly, it is important to remember that target acquisition and engagement must be based not only on the importance of targets to the enemy force, but also on the vulnerability of such targets and the resources required to acquire and attack them. An excellent guide to such determination is the target value analysis, portrayed in chapter 3 of the *Fire Support Mission Area Analysis*. This analysis points out some of the high-value targets in various tactical situations that allow us to maximize the effectiveness of our limited fire support assets.

Michael D. Holthus
CPT, FA
Fort Sill, OK

Russian readiness

I have noticed that many journals portray outdated Soviet artillery organization and equipment and are sometimes just plain wrong. Figure 1 is a diagram derived from the latest and most accurate open source material available showing the amount of artillery available to Soviet commanders at each organizational level in Group of Soviet Forces Germany. This should correct any misconceptions anyone has had about the amount of Soviet artillery.

Bert Brown
Fort Sill, OK

Local protection

I am concerned about the local protection of an artillery battery or platoon on a highly mobile, mid- or high-intensity battlefield. By local protection, I mean the organic ability of a small artillery unit to slow an attack by enemy ground elements long enough to allow displacement to an alternate location. At present, organic assets are so severely limited that attack by a single armored personnel carrier exceeds the defensive capabilities of a platoon and perhaps even a battery.

If I had my choice on arming a unit for local protection based on existing, available equipment at each platoon, I would establish a five-man local protection team which would include a team leader, a squad automatic weapon gunner, and three Dragon gunners. The team would be manned by off-shift personnel and would be on call at the battery operations or fire direction center. The team would have a 1/4-ton truck with trailer to carry smoke grenades, antitank and antipersonnel mines, pyrotechnics, a radio, a telephone, communications wire, and other equipment. The vehicle would have a smoke grenade projector mounted on the front and rear bumpers for extra smoke coverage and could be used as the advance party vehicle. A quick fire channel procedure to call for mutual fire support would allow the local protection team to prevent a cheap kill of an artillery unit.

I would arm each artilleryman in the battery position with a CAR-15 type 5.56-mm weapon equipped with a combat sling that allows the weapon to be slung across the back (muzzle down) ready for instant use. Instead of Dragons, I would arm the local protection team with modified M202A1 flame weapon launchers that fire hypersonic kinetic energy rockets with a 0.001-second delay fuze. The team would have 12 shots at its targets. Because the rockets kill both thin- and thick-skinned vehicles, the team could possibly defeat a company-sized unit and maybe attack helicopters.

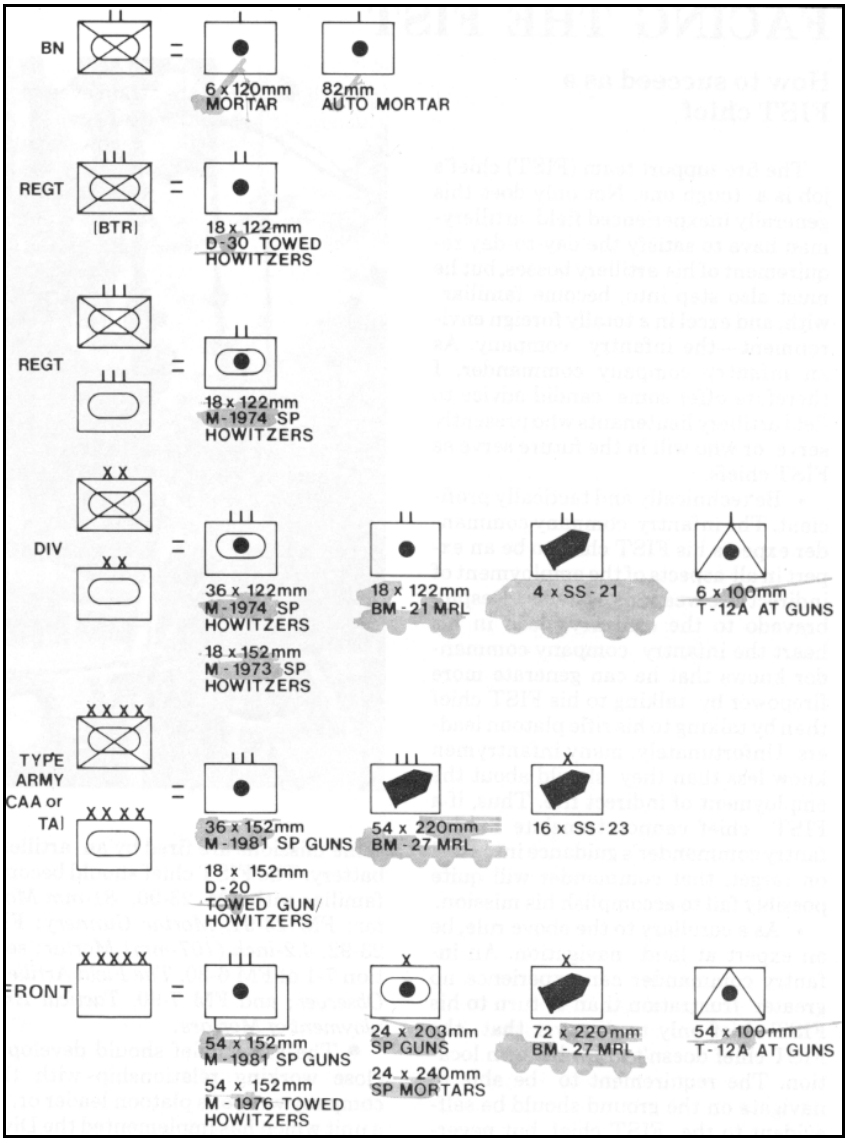


Figure 1. Artillery available to Soviet commanders at each organizational level in Group of Soviet Forces Germany.

We need some improvement in local protection, but what do we use and where do we get the manpower? If the new attempts at automating the firing section prove fruitful, perhaps we could use some of those spaces. We have always had additional duties for off-shift personnel to provide security; we should give them the tools to make them effective.

Larry A. Altersitz
MAJ, FA
Woodbury, NJ

Local protection of the cannon battery against air and ground attack is a problem of critical importance. The Field Artillery School's experts on survivability believe that mounting smoke grenade launchers on battery vehicles makes sense—not just on advance party vehicles but on a sampling of vehicles throughout the battery. They also concur that the Dragon is an impressive weapon and note that it is now being fielded in the batteries of the heavy division artillery. The Field Artillery School survivability experts are not completely familiar with the M202A1 flame weapon launcher; but, if it will enable a battery reaction team to defeat an enemy company, it should be an excellent weapon for local protection. They will investigate. —Ed.

FACING THE FIST

How to succeed as a FIST chief

Photo by CPT Pat Sweeney

The fire support team (FIST) chief's job is a tough one. Not only does this generally inexperienced field artilleryman have to satisfy the day-to-day requirement of his artillery bosses, but he must also step into, become familiar with, and excel in a totally foreign environment—the infantry company. As an infantry company commander, I therefore offer some candid advice to field artillery lieutenants who presently serve or who will in the future serve as FIST chiefs.

• Be technically and tactically proficient. The infantry company commander expects his FIST chief to be an expert in all aspects of the employment of indirect fire weapons systems. Despite bravado to the contrary, deep in his heart the infantry company commander knows that he can generate more firepower by talking to his FIST chief than by talking to his rifle platoon leaders. Unfortunately, many infantrymen know less than they should about the employment of indirect fire. Thus, if a FIST chief cannot translate his infantry commander's guidance into steel on target, that commander will quite possibly fail to accomplish his mission.

• As a corollary to the above rule, be an expert at land navigation. An infantry commander can experience no greater frustration than to turn to his FIST chief only to discover that the FIST chief doesn't know his own location. The requirement to be able to navigate on the ground should be self-evident to the FIST chief, but nevertheless I cannot overemphasize it.

• Be physically fit. In a light infantry unit especially, the FIST chief will be required to leave his vehicle in the company trains and walk (and walk, and walk) with the infantry company. This may not seem like a difficult task, but when the FIST chief first picks up his rucksack in which he packed his PRC-77, GVS-5, and DMD, he'll understand the challenge that awaits him.

• Understand the capabilities and employment of mortars. It is entirely possible that mortars may be the only means of indirect fire available to the FIST chief. The FIST chief must understand the technical and tactical aspects of the employment of mortars; they differ somewhat from the techniques of employing field artillery. The FIST chief must also understand how to adjust mortar fire. The observed fire procedures for some mortar missions (registration, for example) are different from the procedures used when those same missions are fired by an artillery battery. The FIST chief should become familiar with FM 23-90, *81-mm Mortar*; FM 23-91, *Mortar Gunnery*; FM 23-92, *4.2-inch (107-mm) Mortar*; section 7-1 of FM 6-30, *The Field Artillery Observer*; and FM 7-90, *Tactical Employment of Mortars*.

● The FIST chief should develop a close working relationship with the company weapons platoon leader or, in a unit which has implemented the Division 86 table of organization and equipment, the battalion mortar platoon leader. These officers are often graduates of Fort Benning's Infantry Mortar Platoon Course and are normally quite knowledgeable about their weapon systems. The weapons platoon leader should be able to provide the FIST chief with the latest Infantry School doctrine on the tactics and techniques of mortar employment.

● The FIST chief should strive to become part of the infantry commander's team. He should not appear in the infantry company only when the battalion fire support officer tells him that he's got to go to the field with the grunts. The FIST chief should stop by the company occasionally to see if he can provide any assistance to the commander. The FIST chief must emphasize the importance of indirect fire support to the infantry commander and convince him that the FIST chief can be of invaluable help in planning and executing garrison-type training as well as major field training exercises. When the infantry commander asks for his presence and assistance, the FIST chief should make every effort to ensure that he is available.

● The FIST chief should display a positive attitude and a genuine desire to succeed. He must not think that he has been exiled to the infantry because all the fire direction officer and executive officer slots in his battalion are filled. Instead, the field artillery lieutenant should view his job as a unique opportunity offered to no other officer outside of infantry and armor branches—the chance to work closely with the infantry at the company level.

As an infantry commander, I know that if I can develop confidence in and establish a good relationship with my FIST chief my chances for success on the battlefield will be greatly improved. I am, however, forced to compete with the FIST chief's artillery battalion for his time; therefore, the burden of responsibility for developing this relationship falls on the shoulders of the FIST chief. If a FIST chief follows the simple advice I have offered, he can be assured of laying the foundation for a successful and mutually profitable relationship with his infantry company.

Jeffery A. Jacobs
CPT, IN
Fort Campbell, KY

Who is supposed to train what?

In his letter entitled "FIST deficiencies" (July-August 1984 *Field Artillery Journal*), Major (Ret) Charles E. Mehring addresses a subject which has stirred much interest and concern in both the field and the School. The training of our fire support teams (FISTs) is a topic which always brings forth a debate over who is responsible for training these teams. Certainly, field units assigned FISTs must shoulder a portion of FIST training, but to what extent? The Field Artillery School must share in this responsibility; but, again, to what extent? The problem boils down to "Who is supposed to train what?"

Major Mehring suggests that the School would be able to eliminate FIST problems through training that would "...coalesce the already well-taught *individual tasks* into the *systemic competence* (I added the italics for emphasis) needed for effective FIST performance." Here lies the crux of the problem. The responsibility for individual training and systemic (unit) training must be delineated. For soldiers to train effectively as a unit, individual training is a basic requirement. By looking at the problem as a two-edged sword, with one edge complementing the other, we can easily establish responsibility for these phases of training.

The feeling that the School should provide solutions to all problems seems endemic in the Field Artillery Community; however, the School is not structured to meet this demand. It is charged with the responsibility of providing lieutenants to the field with a foundation upon which all subsequent training can be built. Unlike our allied counterparts who school incoming junior officers in only one aspect of field artillery and subsequently assign them to duties commensurate with their training, the Field Artillery School trains junior officers in skills pertaining to observed fire, fire direction, fire support, and firing battery operations—at one school and at one time. Our junior officers are prepared to handle a multitude of tasks in preparation for assignment to the field. In other words, the School focuses its attention on intensive individual training.

The School instructors would like to have more live-fire exercises, walking shoots, and student time in the Training Set, Fire Observation; but there is not enough time available for this. Budgetary constraints cause restrictions in ammunition, facilities, and personnel. And, if the School intensifies training in one area, such as FIST, it must reduce training in another; to do so would likely upset the balance of training that provides the student the foundation upon which subsequent training in his unit can be built.

A "crosswalk" in School training as suggested by Major Mehring does exist. For example, during Gunnery Department observed fire shoots, instructors address the role of the FIST and the duties and responsibilities of the FIST chief. More importantly, the students apply all the training they have received throughout the School's Basic Course when they participate in the Seven-Day War. This closed-loop exercise places the students in positions such as the FIST chief, fire direction officer, executive officer, and battery commander. However, training at the School cannot be expected to be complete; nor can it stop when the lieutenant leaves the School. The approach which the lieutenant's commander takes toward the continuance of training will have the greatest effect on reducing FIST deficiencies.

FIST deficiencies will continue to exist as long as field commanders continue to assign new lieutenants as FIST chiefs. The lieutenant fresh from the Basic Course does not have the requisite, practical knowledge to be an effective fire support coordinator. If Basic Course graduates are assigned to battery positions, they can better acquire the technical competence in field artillery operations to become capable fire support coordinators. Once commanders begin to assign our experienced battery officers, rather than our inexperienced lieutenants, to fire support positions, the FIST deficiencies will be reduced. To have efficient fire support teams, each commander should assess the situation and determine which position should have the more experienced officer—the FIST chief who is out on his own or the fire direction officer who has a commander and executive officer on whom to rely for assistance.

The Field Artillery School is responsible for individual training, but the unit commander is responsible for collective training. Each must do its job to complement the other; cooperation is the only solution to reduce FIST deficiencies significantly.

John T. Hutchinson
MAJ, FA
Fort Sill, OK

A good product

Major (Ret) Charles E. Mehring's letter entitled, "FIST Deficiencies" (July-August 1984 *Field Artillery Journal*) addresses the issue of how best to train our current and future fire support team (FIST) chiefs. His initial point is well taken—the Field Artillery Officer Basic Course is not designed to provide the field commands with a totally proficient lieutenant who is knowledgeable in all aspects of the multitude of duty positions to which he may be assigned. I feel, however, that the Field Artillery School does provide that lieutenant the basic tools and entry-level knowledge to be an effective artilleryman, if not a totally proficient one.

In attempting to ascertain the root cause of perceived FIST deficiencies, Major Mehring examines Field Artillery School instruction and field unit sustainment training. However, he neglects the personal responsibility and sense of professionalism which should motivate a new lieutenant to seek competency on his own and not wait to be "spoon-fed" by the School or his field unit's training program.

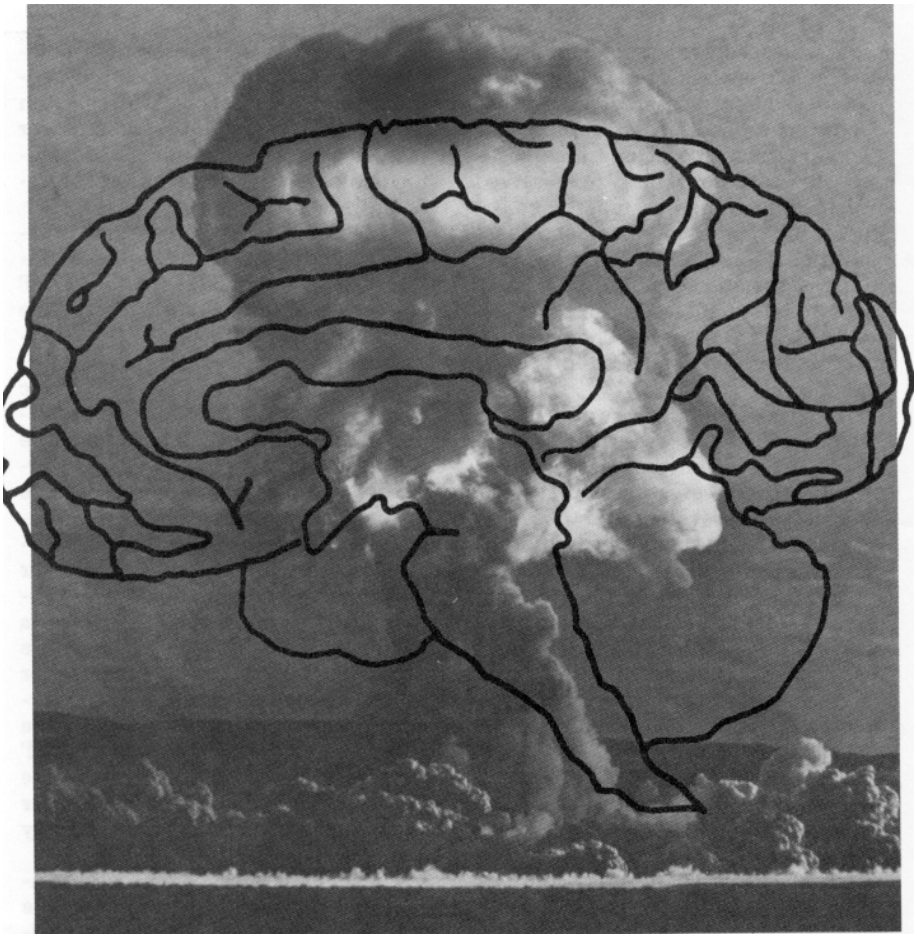
Major Mehring questions the vagueness of performance standards in the area of tactics. But what is a "correct" organization for combat? What is a "correct" fire plan for a given operation? Tactics, unfortunately, do not lend themselves to simple schoolbook solutions. All we can ask is that the lieutenant follow adequate thought processes and consider all relevant factors. Often the acceptable standard *must* be "in accordance with the doctrinal precepts as outlined in FM 6-20."

I appreciate Major Mehring's desire to produce a better FIST chief for the field. I contend, however, that a good product is already reaching the field.

J. Newland
CPT, FA
Fort Sill, OK

Speak Out

The *Journal* welcomes and encourages letters from our readers. Of particular interest are opinions, ideas, and innovations pertinent to the betterment of the Field Artillery and the total force. Also welcomed are thoughts on how to improve the magazine.—*Ed.*



MIND OVER MAYHEM

by Captain Peter E. Haglin

The nuclear battlefield heaps new, weighty responsibilities on the shoulders of those who will lead American soldiers and who strive to accomplish the mission and survive. The shock of massed casualties places stresses on frontline soldiers and may radically affect their ability to continue the operation. The burden of ensuring their survival and their willingness and ability to continue to fight falls squarely on first-echelon leaders. Those leaders must use their skills to deal effectively with both the stresses on themselves and their soldiers.

The keys to leadership on the nuclear battlefield outlined below are for frontline infantry, armor, and field artillery company-level commanders, platoon leaders and sergeants, and squad leaders. These are the leaders who must exert control over the mayhem of the dirty battlefield.

The company-level units led by these "green tabbers" are normally close enough to the enemy frontlines to preclude absolute devastation caused by the tactical nuclear weapons, but they are also close enough for their soldiers to see, hear, and feel the profound effects of the nuclear detonations just behind them. Unfortunately, empirical data is scarce pertaining to the effects of such events on soldiers. However, by combining pertinent data extracted from civil "disasters" as well as from isolated, horrific military operations which approximate some of the same effects, leaders can infer the prerequisites for successful leadership in this violent environment.

The stress on soldiers begins before they actually arrive on the nuclear battlefield. They have already been exposed to a tremendous amount of information, both erroneous and factual, concerning the "nuclear war." The nuances of nuclear targeting and effects of strategic and tactical nuclear weapons are by and large unknown or unimportant to them. Movies such as *The Day After*, *Damnation Alley*, and *Dr. Strangelove* have left them with an indelible impression of what to expect should a mushroom cloud rise behind their battle positions. Their experiences and involvement in church, school, family, or civic organizations have in all probability already laid the groundwork for moral conflict between what they are duty-bound to do and what appears most personally useful. Although the soldiers are probably too young to recall, their leader may well remember the sentiment contained in the slogan: "What if they gave a war, and nobody came?" Thus, leaders and soldiers may arrive on the nuclear battlefield with a sense of doom, moral quandry, and fatalism.

The battlefield itself will be initially littered with the devastation caused by increasingly efficient and deadly conventional weapons. Some of the soldier's buddies might well have already been killed or maimed. Smoke, gunpowder, rotting flesh, and debris will assault all of the soldier's senses as the threat of nuclear destruction lingers in the back of his mind. The fighting in front of him may slacken a bit as the enemy attempts to pull his forces back in order to fire the nuclear weapons closer to what was the enemy's old positions. Suddenly, the soldier will experience brilliant flashes of light, followed by tremendous shock waves and intense heat. He will know instantly what has happened, but he will have no idea of the actual extent of damages to his person or in the areas to his rear. He will not know whether he was close enough to ground zero to receive a fatal dose of radiation, but he will know that this deadly mechanism is invisible, travels over great distances, and kills quickly and painfully or slowly and painfully. He may not know that the enemy intends to follow the strikes with fast and violent attacks with conventional and possibly chemical weapons. Neither is he likely to know that the greatest threat to his survival is not the effect of the nuclear weapons, but his capacity to absorb the accompanying stress and function well enough to withstand the enemy's conventional onslaught. He will feel isolated and soon realize that only his near buddies and immediate leaders count. In order for this soldier to survive, his leaders and group must have been properly trained and conditioned. They must, above all, be willing to react quickly.

By deleting the word "nuclear," the above scenario might well have described the 30th of July, 1864, at Petersburg, Virginia. That morning, at 0440 hours, Union forces detonated a mine buried directly below Confederate troops defending east of the city; 8,000 pounds of black powder exploded, creating a gap stretching over 500 yards in the center of the defensive lines. Confederate soldiers as well as Union soldiers either froze or fled as they surveyed the unexpected catastrophic devastation. Command and control of major units were lost on both sides as the soldiers reacted to this radical new form of destruction. The Union forces were unable to execute their exploiting attacks because of the shock suffered by their soldiers. By the time the Union attacks were mounted, the Confederate soldiers had recovered sufficiently enough to blunt the attacks with savage defensive fires and inflict heavy casualties. The same capabilities of the Confederate soldiers to withstand this stress and the ability of their leaders to rally their soldiers must also be developed in today's soldiers if they are to survive on the tactical nuclear battlefield.

In his specialized yet informative article, "Psychological Considerations in Atomic Warfare," A. J. Glass described the initial conditions in which leaders will find their soldiers:

> *...external threat produces acute inhibitory fear reactions which further burden the evaluatory process. With the passage of varying but brief periods of time and a consequent better grasp of their surroundings, most persons regain sufficient control to permit such goal-directed efforts as precipitous flight away from danger or quick movement to a place of presumed safety* [emphasis added]. *While immediate concern is usually for self-survival, very soon thereafter, social consciousness is reawakened in many persons who, even though handicapped by distressing fear, nevertheless perform unselfish acts in behalf of loved ones, comrades, friends, and even strangers. Military experience strongly indicates that with the resumption of purposeful activity* [emphasis added], *fear is diminished or dissipated. It would seem that when a person responds correctly to the urgent demands of the situation, tension is discharged. On the other hand, inaction under threatening circumstances fosters the building up of fearful sensations* [emphasis added] *which only inhibit further, and thus a vicious cycle of worsening noneffective behavior is established.*

Moreover, Glass describes the emotional disruptions which produce the fear reactions as:

> *...temporary, changeable reactions, which are self-limited, lasting for minutes, hours, days, and more rarely weeks. Because they are disorganized or helpless, these persons are readily influenced by the attitudes of others* [emphasis added], *a fact that has practical application for the control of their symptoms and noneffective behavior following the cessation of the danger.*

The four critical points Glass makes in his admittedly stilted observations are that soldiers are readily influenced by the attitudes of the members of their group, purposeful activity helps to diminish fear, efforts to move to safety should be made soon after the event, and the results of inaction can be devastating.

While Glass describes the likely individual responses to the nuclear event, R. Vineberg, in his article "Human Factors in Tactical Nuclear Combat," places the individual responses into a group context.

> *The forces of group identification thus serve to sustain both the group and individual. The sense of duty and responsibility that men feel toward the group preserves the group and makes it a functioning fighting unit. The group sustains the man by providing both physical aid and psychological support. Thus, the identification of a soldier with his unit tends to exert an effect, at least for a short period of time, even after a man has left combat....*

Consequently, a leader has a strong ally in the rest of the group if he can energize the individuals in this group to follow the courses of action which will best assure the group's survival. Also, an individual's emotional survival is best guaranteed by purposeful activity and movement to presumed safety. Combat doctrine suggests that physical survival is keyed to acknowledging the enemy's impending attacks and preparing for and countering them. The problem then becomes energizing the group to do these things.

In their "Organizational Behavior, an Applied Psychological Approach," D. W. Organ and W. C. Hamner introduce the key to the energizing function by describing common reactions to the resulting frustrations that the nuclear event will also cause individuals to feel.

> *Frustration generates a predisposition to aggression (often labeled anger), but...other factors determine both whether aggression takes place and the form of aggression that is manifested if it does. It seems plausible to view aggression as a "last resort" after alternative methods of coping have failed but before exhaustion has occurred.... When aggression itself is unsuccessful or completely blocked, apathy or withdrawal follows. In this light, the milder forms of aggression are a healthy sign, since they reflect a will to struggle with the environment rather than to submit resignedly to failure.*

While Organ and Hamner's writings are directed toward behavior in business organizations and consequently do not advocate "overaggression," the military leader should be more disposed to foster this aggressive attitude to ensure that the soldiers do not accept apathy or withdrawal.

Based on the predicted responses of soldiers in a tactical nuclear battlefield environment, commanders must develop an educational and training program for soldiers and their leaders.

Factual education

Both leaders and soldiers should be provided facts concerning the use and effects of tactical nuclear weapons. The proper set of facts, presented in terms relevant to the soldiers' experience and learning capabilities, will assist in altering the psychological predispositions they would otherwise have; for example:

- Although the use of tactical nuclear weapons represents an escalation in fighting, it need not equate to strategic use or the annihilation of the human race.
- While radiation is a very potent killing mechanism, it does not travel forever; also, in the case of many weapons, radiation loses its effect shortly past the boundaries of the blast and thermal effects.
- Although nuclear weapons can devastate large areas, many soldiers close to the detonations will survive.
- The enemy is not trying to use tactical nuclear weapons to destroy areas arbitrarily, but is trying to hit selected targets.

Our leaders must know what to expect of the enemy immediately after a nuclear attack. The leaders must appreciate the conventional threat to his

unit after his personnel survive the initial nuclear effects. Leaders and soldiers need to place the detonations in a perspective which will assist them in responding more rapidly to the events. By reacting properly to the situation and more rapidly than the enemy forces, the leader enhances his unit's chance for survival.

Group structure

The military leader must build, stabilize, and emphasize the group structure or, as it is now popularly termed, "cohesion." The soldiers must feel that the group or unit will protect them, provide for them, and help them survive. With the confusion of the strikes to the unit's rear, soldiers need the security of the group for personal stability. The turbulent environment causes soldiers to be more susceptible to the attitudes and behavior of others; consequently, the leader must nurture a bond of loyalty through deeds and trust. The "buddy system" becomes a logical place to start this effort. If the leader maximizes training situations which demand teamwork (starting with pairs and building to full group participation), the soldiers will acquire a sense of belonging and will contribute more to the group. Off-duty activities should be included in this effort as well as formal training time. Physical training periods should emphasize group sports such as basketball instead of individual activities such as running.

The leader must be truthful to maintain his integrity within the group. Mutual confidence depends on the established bond of honesty and candid presentation of facts. If the leader withholds information or presents untrue or misleading information to his soldiers, the group will cut him out of its decisions during times of stress.

Aggression

The preconditions necessary for aggression will always be present on the battlefield. The danger of blocking the aggression and allowing apathy and fatalism to take hold is accentuated on the nuclear battlefield. Without proper education, soldiers might view detonations as blind and random destruction, against which they are helpless. It becomes important for the soldier to realize and accept the fact that the enemy is trying to hurt him or his group and that channeled aggression toward that enemy is necessary to stop him. Knowing this will help the soldiers direct their efforts as the emotional disturbances caused by the detonations subside. As the group decides to react against the enemy, it reinforces those same desires felt by the individuals, and the system becomes self-perpetuating.

Photo by Sam Orr

Relative safety

As the emotional disturbances subside and rational action again becomes possible, the soldier's desire to inflict damage on the enemy may be overcome by his desire to move to a position of relative safety unless he has been trained in what action he should take. What may seem to be mutually exclusive courses of action can be rationalized by explaining beforehand that the closer a group is to the enemy lines, the more remote is the potential for being affected by subsequent nuclear detonations. If the group moves forward fast enough and aggressively enough, it will not only remove the threat of additional strikes but it will also be able to strike back against the enemy.

Immediate activity

Immediately after the nuclear detonation, the leader must get his group to resume productive activity because the group's survival depends on how quickly they can return to a fighting posture. The leader should not allow one or two soldiers to begin "radiological monitoring" while the rest sit and brood. Blind movement forward, however, may place the unit in a position where it is isolated and can be destroyed. Therefore, the leader must move his unit to a militarily sound position where it can attack the enemy or withstand the enemy's eventual maneuvers and conventional attacks. The faster the unit rejuvenates itself, the more chance it has for survival. Therefore, the better trained and educated the leader, the better chance he has to revitalize his soldiers and allow them to survive.

A knowledgeable, skilled leader whose motivation and self-discipline anchor his personal resolve in times of high stress can train his soldiers to survive the emotional shock of nuclear explosions. He can train them to maintain "mind over mayhem."

CPT Peter E. Haglin, FA, received his commission from the United States Military Academy in 1975. He is a graduate of the Field Artillery Officer Advanced Course and has served in a wide variety of artillery assignments around the world. He has commanded a headquarters and service battery in Korea and a detachment in the Netherlands. Captain Haglin is now assigned to the United States Army Combined Arms Center at Fort Leavenworth, Kansas.

HIDE, HARDEN, and HUSTLE

by Captain Robert D. Lewis

The primary mission of the field artillery is to provide continuous fire support to the maneuver arms; to accomplish this mission, artillery units must be able to survive. The Army's doctrinal literature offers suggestions on how to enhance unit survivability; however, many of these suggestions require additions to a unit's modified table of organization and equipment (MTOE). Here are some suggestions on how a field artillery battery can conduct survivability operations using its current MTOE. The techniques described are based on a European scenario, but they have applicability worldwide.

Analyzing the Threat

The battery commander must analyze the capabilities of the Threat to identify appropriate survivability tactic. For example, the US division might be opposed by two or three first echelon motorized rifle divisions. Follow-on echelons might include a Threat combined arms or tank army. The Threat will likely have air superiority and can normally mass artillery tubes against us at a ratio of 6 to 1. For the purposes of breakthrough attacks, the Threat can mass artillery at a ratio of 12 to 1. The enemy's basic loads will include 50 or 60 percent chemical munitions. The Threat can not only use its nuclear capability, but it also has an extensive electronic warfare arsenal.

Based on his analysis of the Threat, the battery commander identifies the enemy's capabilities that are most likely to affect his operations, and develops appropriate techniques to enhance his unit's survivability. The following enumeration of the Threat capabilities resulted from one USAREUR battery commander's analysis.

- ***Nuclear, biological, and chemical (NBC)***—Those units with initial positions in the covering force can expect early Threat employment of nonpersistent chemical agents. These attacks will be to disrupt command and control, cause mass casualties, and precipitate a Threat breakthrough of the forward line of own troops (FLOT).
- ***Counterfire***—The Threat has extensive target acquisition capabilities, but the bulk of these capabilities are based on sound and flash. Friendly artillery must be heavily engaged in firing for the Threat's system to locate firing positions. However, given the target-rich environment expected on the future battlefield, we can expect counterfire. The Threat can dedicate massive artillery assets to the counterfire role.
- ***Aircraft***—The Threat will have air superiority at the beginning of the battle. Not only can the Threat dedicate high-performance attack aircraft and helicopters against friendly batteries, but he can also supplement his target acquisition assets through the use of reconnaissance aircraft.
- ***Electronic warfare (EW)***—As nuclear-capable units, artillery batteries and battalions are prime targets. The Threat can use direction-finding and jamming techniques to target artillery units.
- ***Special forces***—The Threat has large numbers of special forces which he will probably employ in depth behind the forward line of own troops (FLOT). Although their primary targets will be command and control centers and logistic concentrations, these special forces, which are primarily light infantry, may threaten the artillery battery through ambushes in the rear areas.
- ***First-echelon armored forces***—The artillery battery's ability to protect itself against an attack by Threat armored forces is relatively poor; therefore, it must retain its ability to hide and run.

Photo by Sam Orr

Survivability principles

The battery commander must develop the means to enhance his unit's ability to survive the Threat's impressive attack capabilities. Here are some tactics, procedure, and techniques to counter the Threat.

- ***Increase battery NBC training***—The battery commander should ensure that his NBC equipment is ready and institute a training program for the NBC defense of his battery to include detection, prediction, individual and unit protection, and decontamination of personnel and equipment.

- ***Disperse the firing battery***—The battery commander must increase the distance between the guns and disperse the battery by dividing it into independent platoon elements.

- ***Conduct survivability moves***—The battery must be prepared to conduct short moves for survivability. Each of the independent platoon elements must be able to move, but must maintain a high percentage of tubes available for firing.

- ***Reduce the size of the firing battery***—To maintain the ability to survive, the battery must be made as small as possible. All administrative and support elements must be removed from the firing positions.

- ***Reduce the electronic signature of the battery***—To reduce detection by Threat EW capabilities, the battery must limit its AM and FM traffic by seeking other methods of communication.

- ***Hide the battery***—The commander must position his battery or platoons to take maximum advantage of the terrain in order to conceal his unit and reduce the effectiveness of indirect fire.

Reduction in size

Reducing the size of the firing battery has several advantages. With fewer vehicles to control, the battery is more mobile; more positions are usable; the battery can be more easily hidden; and the effects of Threat fires are reduced. All elements not essential to the fire support mission must be removed from the firing battery's position. Elements which can be removed include mess, supply, ammunition, and the bulk of the maintenance section. These elements would be consolidated with the battalion assets to form the battalion trains.

Supply

Normally all classes of supply will be drawn from the battalion trains or predetermined resupply points. This system places a premium on the planning by commanders, operations officers, and logisticians. Friendly forces will not enjoy the luxury of conducting frequent emergency resupplies because the battalion trains does not have the assets to conduct battery deliveries. All classes of supply can be issued to the firing units during battery movements. Coordination is the key to the conduct of logistic support operations. The battalion operations section must be able to project battery movements and ammunition requirements at least 24 hours in advance, and these requirements must be communicated to the logisticians. Both operators and logisticians must coordinate resupply locations or "hot spots" where batteries can draw their essential materials.

As the distances between the firing units and battalion trains increase, the battalion should operate a dual trains system as outlined in FM 6-20-1. In essence, this system places a combat trains within one to three kilometers of the firing units and field trains farther to the rear. Immediately responsive to the needs of the firing batteries, the combat trains has the capability of providing POL and ammunition resupply, vehicle recovery, and limited maintenance and medical aid. All other logistics agencies are located in the field trains, 20 to 25 kilometers from the forward line of own troops (FLOT). The field trains gathers assets from the division and corps support commands and pushes these assets forward to the combat trains. The combat trains will then distribute the supplies to the batteries. The key to this system is battalion-level control of all services, supplies, and maintenance.

NBC defense

As mentioned earlier, the Threat will employ chemical weapons early in the battle. Enemy artillery or aircraft will place nonpersistent chemical agents (nerve and blood) on firing positions. (The Threat forces will use the nonpersistent agents so they can use the ground after the attack.) The battery commander must ensure that his personnel know how to detect these two agents. Currently, the M256 chemical detection kit is available for section use. All section members must be trained to use it. All reconnaissance operations must include an NBC survey of the position areas. Road marches will likely be conducted under mission oriented protection posture (MOPP) 4 conditions. The battery commander should train his battery to assume automatically the appropriate MOPP and require that his unit practice all of its round-the-clock missions in all levels of MOPP. The commander must support the NBC noncommissioned officer to ensure that required maintenance is performed on NBC equipment and that required supplies are requested and on hand. The commander trains the battery to decontaminate itself with both internal and external equipment to include the battalion's M12 decontamination apparatus.

Dispersal

The battery commander must tailor his battery to the Threat and terrain in order to counter NBC, counterfire, and air attacks. Positions which offer cover and concealment are scarce; therefore, the commander should break up and disperse his unit to take full advantage of the terrain. The firing battery can be broken down into two howitzer platoons and a fire

direction platoon. Each of these elements must be capable of independent reconnaissance, selection, and occupation of position (RSOP); movement; and defensive operations. To control these platoons, the commander must disperse the battery's leadership. The battery executive officer, first sergeant, chief of firing battery, and gunnery sergeant could be organized in pairs with each pair assigned to supervise a howitzer platoon. Each howitzer platoon would consist of four-howitzer sections, a communications element, and an advance party element. Platoons would be dispersed from 500 to 1,500 meters, and howitzers within the platoons would be separated by 300 to 400 meters of ground. The howitzer platoons must make maximum use of the terrain for cover and concealment and must be prepared to move frequently for survivability. These moves should be between 500 and 1,500 meters in length from the former position. Platoons may be required to move as often as every four hours; therefore, moves must be coordinated with the battalion operations section to ensure that maximum firepower is available at all times.

Fire direction element

Since the fire direction element possesses a highly patterned electronic signature, it must also conduct frequent survivability moves. The fire direction element, commanded by the assistant executive officer, consists of the fire direction center and also the battery's field storage location when special weapons are stored within the battery. When the fire direction center moves, the battery operations center must be capable of performing the battery's technical fire direction.

Electronic signature

The Threat possesses a formidable electronic warfare arsenal and will use its capability for jamming friendly communications and finding friendly nuclear delivery units. The battery commander must make communications planning a significant portion of his operations; this vital aspect cannot be left up to the inexperienced signal lieutenants from the battalion. By aggressively conducting electronic countermeasures (ECCM), the firing battery can significantly reduce it chances of being acquired; for example, the battery can use directional antennas for both AM and FM radios, make extensive use of wire communication, and reduce radio traffic on all nets.

- Directional antennas—As Colonel Andrew McVeigh indicated in his article "Your Right to Survive" (May-June 1983 *Field Artillery Journal*), the battery's communication section can build an antennas switching box which allows a radio to transmit directionally and receive omnidirectionally. The commander must require that operators of all radio sets religiously use directional antennas.
- Wire communication—The battalion should strive to communicate all of its fire direction traffic over wire and the battery should use wire as its primary system of communication within the battery.
- Command radio traffic—Radio traffic on the battalion command net can be reduced by making maximum use of the civilian telephone system. Within the numeous built-up areas in Germany, the commander must establish telephone drops that will remain active during wartime.

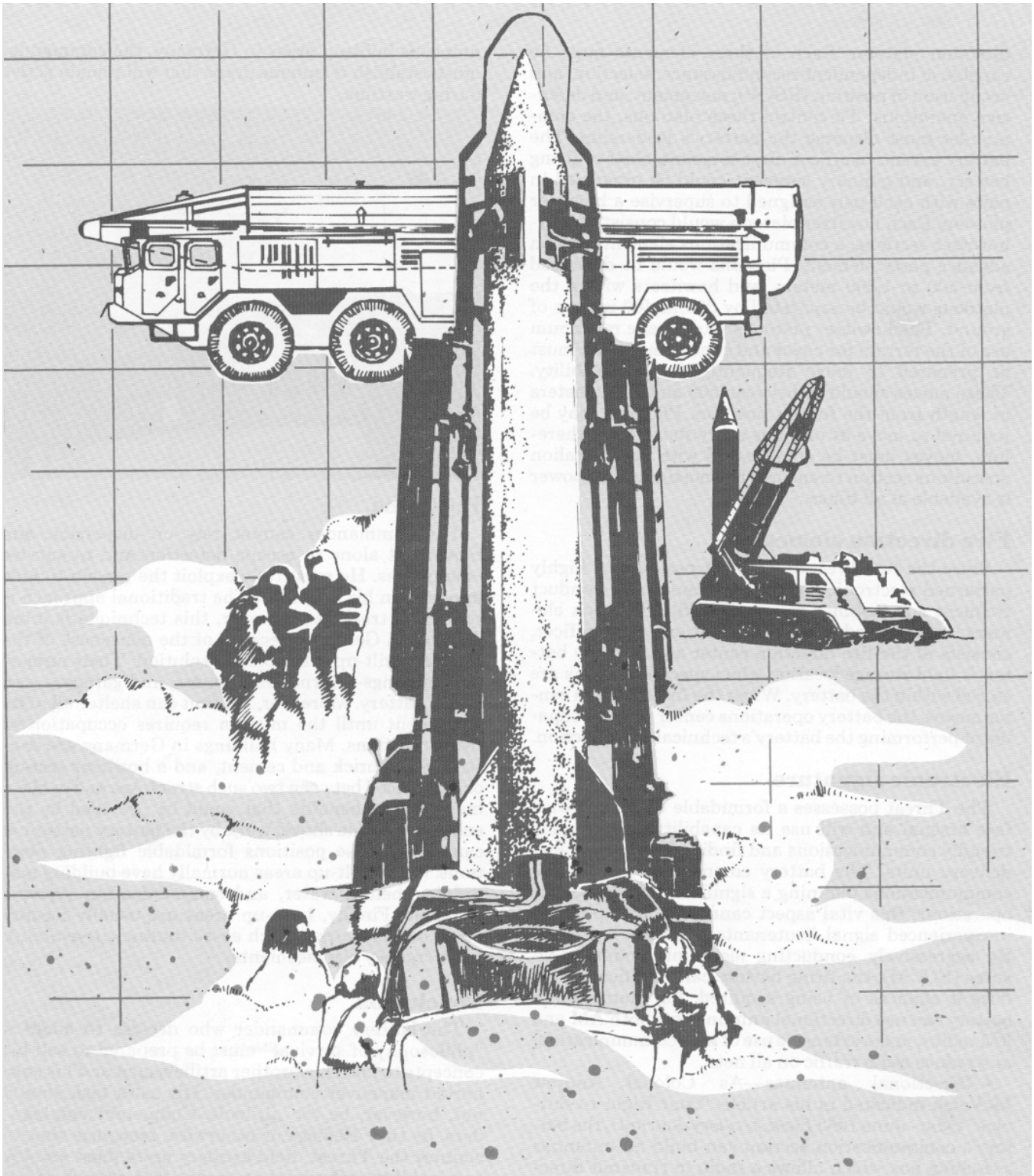
Positions

The commander cannot rely on dispersion and movement alone to escape detection and to survive enemy fires. He must fully exploit the terrain to hide and harden his positions. The traditional approach is to occupy treelines; however, this technique is often difficult in Germany because of the denseness of the forests. Built-up areas offer a solution. Their numerous buildings—barns, warehouses, and garages—can hide a battery. Moreover, the unit can shelter all of its equipment until the mission requires occupation of firing positions. Many buildings in Germany are constructed of brick and cement, and a howitzer section can be placed between two such structures and achieve many of the benefits that could be provided by the engineers. Some shovel work by the battery personnel can make these positions formidable fighting positions. Also, built-up areas normally have building materials, shelter, water, and communication systems available. Finally, built-up areas are usually located near road networks which eases routine survivability or emergency displacements.

Conclusion

The battery commander who decides to adopt a "philosophy of survival" must be prepared to sell his concepts to both his brother artillerymen and his supported maneuver commander. His sales task should not, however, be too difficult. Competent commanders, be they Redlegs or otherwise, recognize that to counter the Threat, field artillery units must employ survivability techniques to ensure that enough of the force survives to provide efficient and effective fire support to maneuver units.

CPT Robert D. Lewis, FA, received his commission from the ROTC at the University of California at Davis in 1977. His field artillery assignments have included a variety of staff positions as well as two tours as a battery commander in Europe. Captain Lewis is currently assigned to the 2d Battalion, 10th Special Forces Group at Fort Devens, Massachusetts.



SCUD, SCALEBOARD, and Scuttlebutt

by Captain Scott R. Gourley

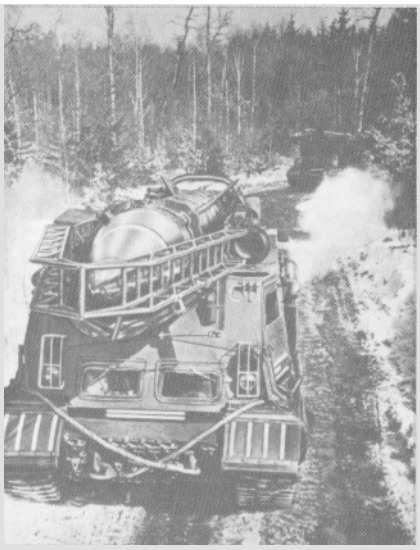
During their drives against Nazi Germany in the latter years of World War II, the military forces of the Allied power captured numerous German defense plants and production factories along with much of the engineering talent required to operate the facilities. It is no secret that the Allied nations put some percentage of these individuals and their equipment into their own service during the ensuing Cold War. One of the "finds" that held the greatest interest for both eastern and western military forces was the German V-2 rocket and its associated technology.

In the Soviet Union, the S. P. Korolev Design Bureau used the V-2 as a starting point for its experiments into new generations of Soviet tactical-range missiles. By the late 1940s and early 1950s the Bureau was developing test bed systems that would become known a the SS-1 and SS-2. These long-range tactical missile would become a vital part of Soviet military thinking.

Thirty-five years and several technological generations later, the V-2 technology and the early Soviet test beds have evolved into two battlefield systems that provide the Soviet Army and Front commanders with increased tactical flexibility and long-range conventional, chemical, and nuclear firepower. The systems, known by the US designations SS-1c and SS-12, are most familiar under their NATO code names, SCUD and SCALEBOARD.

The SCUD A (SS-1B) missile system was first seen in 1957 during the same parade that initially displayed the FROG 1 and was carried on the same basic JS3 tank chassis. The modified chassis featured a built-up area for the operating crew while the missile sat in a frame structure that extended beyond the front of the vehicle and around the nose of the missile. Unlike the FROG, the SCUD missile was fueled with liquid propellant. The missile was 10.4 meters long and credited with a range of 180 kilometers.

During the Moscow parade on 7 November 1961, the SCUD B (SS-1c) made its first public appearance. Visible differences from SCUD A included additional air bottles on each side of the vehicle cab and a longer missile (11.4 meters). The SCUD B was credited with improved range, guidance, and reliability characteristics over SCUD A. Contrary to one commonly held belief, the SCUD B initially appeared on the same modified tank chassis as the SCUD A. Four years after its public debut, the SCUD B appeared on an MAZ-543 chassis, an eight-wheeled transporter-erector-launcher that could be reloaded after firing.



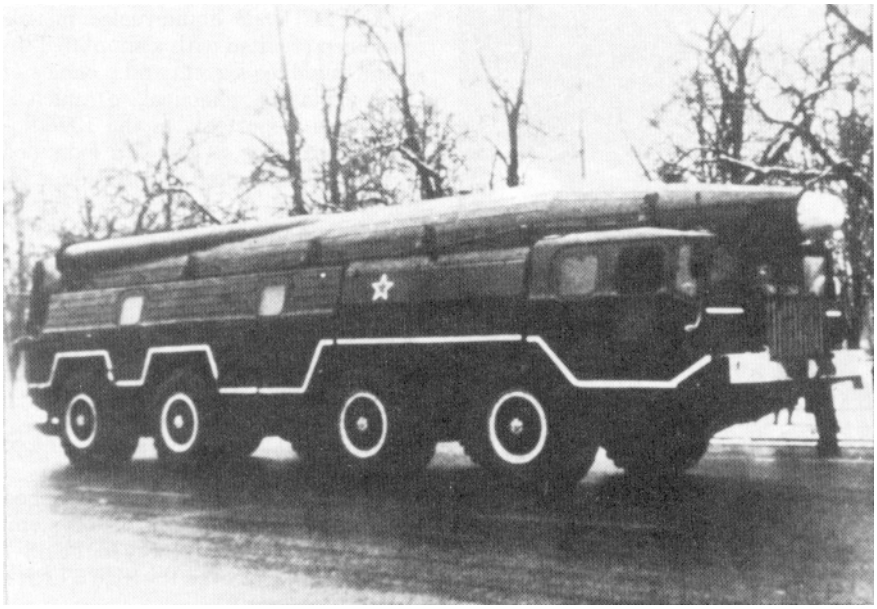
SCUD-A on modified tank chassis.

The SCUD B liquid-fueled missile has been credited with a simplified inertial guidance system and a choice of high-explosive, chemical, or nuclear warheads (reportedly in the 100-kiloton class). The SCUD B's extended range is usually cited as 280 kilometers (shorter range for the nuclear option).

Of some interest are the occasional open source reports of a "SCUD C" missile. Some sources report that the SCUD C is larger than the SCUD B with a range of 450 kilometers. Other unclassified US Army sources call the 450-kilometer system the KY-3 SCUD. Still other references say that the designation stems from confusion over two SCUD B launch vehicles.

As the early Soviet test beds reached toward a longer-range missile system, the SS-1 and SS-2 gave way to the SS-1 SHYSTER. However, the SHYSTER's

Training with SCUD-B.



The massive SCALEBOARD on parade.

simple rail and pad transport and launch structure would have been extremely vulnerable in combat. The solution was the introduction of the SS-12 SCALEBOARD, first seen in November 1967 and deployed on the same MAZ-543 eight-wheeled transporter-erector-launcher as the SCUD. The SCALEBOARD missile itself is housed and transported inside a ribbed container which is only removed after erection to the vertical launch position. The SCALEBOARD is credited with a maximum range of 900 kilometers; theoretically, launchers in East Germany could strike England. For many years the SCALEBOARD was credited with only a nuclear warhead option in the megaton range; however, recent events lend *strong* support to the existence of at least one nonnuclear option. The split cab of the MAZ-543 transporter-erector-launcher houses the firing crew. The vehicle driver sits in the left cab with some crew members behind him while the launch operator sits in the right cab with his control console and other crew members.

In a combat situation, the SCUD launchers will probably be deployed individually to avoid detection of the entire firing unit. The SCUD brigade's three launch battalions, each containing from three to nine transporter-erector-launchers, will remain under the direct control of the Army and Front commanders and their Chiefs of Rocket Troops and Artillery (CRTA). The four transporter-erector-launchers in each of the three launch battalions making up the Front's SCALEBOARD brigade will remain deep in the zone of the front and be controlled by the Front commander and his Chief of Rocket Troops and Artillery.

In the last few years, many publications have begun referring to "follow-up" systems for both the SCUD and SCALEBOARD. The follow-ons are being labelled the SS-23 and SS-22, respectively. The SS-23 is reportedly replacing the SCUD missile during the early-to-mid 1980 time frame. It will be carried on the same transporter-erector-launcher, and its primary improvements reportedly include increased range (500 kilometers) and improved accuracy.

The SS-22, first deployed in 1978, is replacing the SS-12 SCALEBOARD system. Like the SS-23 improvements over the SCUD, the SS-22 provides longer range (1,000 kilometers) and greater accuracy than the SCALEBOARD.

In addition to increasing Soviet battlefield capabilities, the introduction of a new generation of follow-on systems potentially frees some of the earlier weapons for wider export to the third world. In fact, the Soviets began exporting the SCUD outside the Warsaw Pact as early as 1973, even before the reported fielding of the SS-23.

The decision to ship SCUD battlefield missiles to Egypt was apparently made in March 1973 during the Cairo visit of a senior Soviet military delegation. The first SCUDs reportedly began arriving during April. The arrival of the SCUDs was significant in three respects. First of all, it marked the first time that these systems were shipped outside the Warsaw Pact. Second, it provided the Egyptians with "regionally strategic" weapons; that is, Egyptian SCUDs located near Port Said could theoretically strike several southern coastal cities in Israel. Finally, and perhaps most importantly, even though the SCUDs were serviced and partially operated by Soviet "advisors," they were reportedly placed under the operational control of Egypt.

By the start of the October War, the Soviet Union had supplied the Egyptians with an estimated 30 SCUDs (the Syrians did not receive any SCUDs during this period). In a speech before the Egyptian People's Assembly on 16 October, President Sadat said:

> "Our Egyptian Sinai-traversing Zafer missiles are now on their pads ready for launching at a single signal to the depth of Israel."

It is believed that this was a veiled reference to the possibility of using SCUDs, not Zafirs (Zafers), in retaliation against deep Israeli airstrikes. The Zafir was designed in Egypt in the early 1960s by German technicians. Unresolved guidance system difficulties reportedly kept the Zafir from full deployment. The actual combat firings of SCUD missiles during the October War was widely ignored by the western press. Those sources that do report the incident are not even in complete agreement on the number of SCUDs fired. However, these sources are in general agreement that on 22 October, six days after Sadat's warning speech, the Egyptian Army fired a small number of SCUDs against Israel. All of the SCUDs carried conventional warheads. Whether or not Moscow formally approved the launchings, the Soviet advisors certainly cooperated in the action, implying Soviet willingness to escalate the conflict.

Apparently the SCUD firings had questionable effect on their intended targets. Major General Chaim Herzog, former head of Israeli Military Intelligence, dismisses the results of the firing with the single statement: "It landed in the desert of Sinai."

The months and years following the October War saw wider export of the SCUD, quite possible facilitated by the introduction of the SS-23 into Soviet units. Open sources credit at least Iraq, Libya, and Syria with receipt of the systems. During November 1975, the Syrian Army reportedly test-fired a SCUD over a distance of approximately 250 kilometers.

The next reported combat use of the SCUD system occurred during the Iran-Iraq conflict in December 1983 when sources stated that Iraq fired a series of SCUD B missiles at the Iranian Oil facilities on Kharg Island. Early reports cited analysts' predictions that the SCUD B's circular error probable of 1,000 meters meant that the Iraqis would have to fire up to 10 SCUDs in order to hit the terminal. Later reports cited "little significant damage."

If the introduction of the SS-23 provided SCUD systems for export, perhaps fielding of the SS-22 has freed some of the massive SCALEBOARD systems for use by "client states." As mentioned earlier, for many years the SCALEBOARD was publicly credited with only a nuclear warhead option. This limited option appears extremely unlikely in light of reports published in early 1984.

In February, 1984, widely respected defense sources began to report Iraqi receipt of a number of SS-12 SCALEBOARD missiles from the Soviet union. Even without the nuclear option, the greatly increased range of the SCALEBOARD provided Iraq with a tremendous new deep strike capability.

Most publications ignored the significance of the SCALEBOARD's arrival. More disturbing than the arrival of the missiles is the possible command and control relationship that was created. Looking back at the first SCUD exports a decade earlier, Soviet soldiers were reportedly used to service and operate the systems. Has the Soviet Union made the same troop commitment to Iraq?

In light of the apparent willingness of many third world countries to use these hugh "regionally strategic" battlefield missiles, the Soviet Union's expanding export of these systems is a dangerous trend. Perhaps most ominous is the reported addition of the SCALEBOARD system to the export list. As both systems are increasingly fielded in the world's trouble spots, there is a sad probability that the rockets and their terminal effects will become more familiar to soldiers and civilians alike. Members of the US military and their allies simply cannot afford to ignore the capabilities of these weapon systems or to overlook them in future targeting efforts wherever the SCUD or SCALEBOARD might be employed.

CPT Scott R. Gourley, FA, USAR, is employed by the FMC Corporation Ordnance Division in San Jose, California. A former Threat and Target Acquisition instructor at the US Army Field Artillery School, he is the author of numerous magazine articles and is the recipient of the FORSCOM Fourth Estate Award for excellence in military journalism. He is currently a member of USAR Control Group Reinforcement.

Movers and Shakers—Doers or Thinkers?

by MAJ Roger A. Rains

Organizational excellence begins with the individual, and individual excellence derives from excellent institutional training. General George C. Marshall recognized that axiom when he revitalized the infantry school during the inter-war years; Fox Connor manifested this truism in his tutorship of several officers who would eventually lead armies across Europe; and Winston Churchill applauded the American applications of the principle when he told a group of senior officers at the Pentagon in 1946:

> Professional attainment, based upon prolonged study, and collective study at colleges, rank by rank, and age by age—those are the title reeds of the commanders of future armies, and the secret of future victories.

In the current era of massive doctrinal, organizational, and material changes this postulate is rarely questioned, but frequently forgotten. Soldiers around the world have become so enamored with "doing" that they have given short shrift to "thinking"; they have been persuaded that the time spent as thinkers, teachers, and students is merely time out of a more important career of action in the field. More than a few officers have suggested that time spent as a student or as an instructor is time wasted. They are wrong. The axiom remains as sound today as it has been throughout history. If we are to have an "Army of Excellence" we must first have excellent institutional training and trainers. Only by developing military "thinkers" and teachers can we guarantee that when the time comes our "men of action," our doers, will be sufficient to the task.

In a recent article in *Military Review,* Colonel Huba Wass de Czege captured the essence of the argument when he observed: "The fundamental key to controlling and integrating change effectively is to raise the level of the knowledge and practice of the science and art of war in our Army." To turn that "key" of progress the Army's best scientific thinkers and most artful practitioners must become our institutional teachers. The very best of our senior captains, fresh from battery-level command and tours as fire support officers should step forward to become, after a period of historical and doctrinal study, our doctrine writers and our service school instructors. The very best of our battalion commanders should return to the TRADOC community to study and to lead other "thinkers" as together they train the Army's leaders of the future.

The rewards of adhering to the time-honored axiom will be manifold. Not only will the Army's very best catalyze the development of doctrine and the training of future leaders but also these well-practiced "thinkers" will experience the personal benefits of enhanced competence and satisfaction that come from being the architects of the "Army of Excellence," the Army of the future. When the time comes to be "doers" once more, these professionals who have thought and taught will, like the "thinkers" of yesteryear—Marshall, Bradley, Stillwell, and Patton—be more than sufficient to the task as they lead those who they have taught.

Who then is responsible for applying the principle that excellence in institutional thought and training yields excellence on the battlefield? Certainly the senior leadership of our Army must allocate the necesssary human resources and provide the impetus to ensure that TRADOC gets the very best of our potential "thinkers" and teachers. Moreover, the various proponents must see to it that these leaders are provided the opportunity to study and develop. But the critical prerequisite is the recognition by soldiers in the field that the "Army of Excellence," the Army of our future, will be designed, built, and led by those who step forward to think, plan, learn, and teach now. If they are to serve best, those captains, majors, and lieutenant colonels who profess to be exclusively "doers" and "men of action" must commit themselves to become "thinkers" and institutional teachers as well. As history and the finest traditions of American military service make clear, they, the Army, and the nation they serve will be the better for it.

I think, therefore I survive

by Colonel Robert B. Adair and the Action Group of the 17th Field Artillery Brigade

At the request of Brigadier General Donald E. Eckelbarger, VII Corps Artillery Commander, the 17th Field Artillery Brigade Action Group conducted a study to review all aspects of survivability and to develop a consensus concerning survivability issues among the artillerymen serving the guns in Europe. The action group's findings were presented at the 1984 Senior Artillery Commanders' Conference at Fort Sill. Since then the 17th FA Brigade has received requests for copies of the briefing scripts and invitations to address various organizations. This article responds to these requests by outlining the procedures used by the Action Group, its conclusions, and its recommendations.

Procedures: Stage One—Preliminaries

The definition of survivability used by the study group was: "sustaining a percentage of the field artillery force approximately equal to the strength of the supported force." The group's problem was to determine what the US Army field artillery must do to improve survivability. The group not only dealt with present day systems capabilities and threats, but also looked into the near- and mid-term future. Cannon, rockets, Lance, nuclear weapons, and target acquisition survivability were considered using a scenario based on the following assumptions:

- Artillery units will participate in a European scenario with NATO units opposing Warsaw Pact forces.
- There will be no increase from current levels of manning except as provided for by the Division 86 J-series tables of organization and equipment (TOE) and associated increases in corps artillery units.
- Current intelligence estimate is valid.
- Active Component field artillery units are equipped with TACFIRE and the battery computer system (BCS), but Reserve Component have BCS alone.
- Tactical operations centers (TOCs) will probably be detected and targeted within 12 hours of occupation of position.
- Batteries will probably be detected

targeted within 12 hours of occupation of position.

- Batteries will probably be detected and targeted within six hours of occupation of position.
- Batteries are capable of moving significant distances (5 to 20 kilometers) in response to the battle.
- Lance launchers have a low probability of detection.
- Lance launchers and command posts are most likely to be attacked by air, ground assault, or missiles.
- Cannon units are most likely to be attacked by field artillery, air and ground assault, or electronic warfare.

The group used a European scenario and associated assumptions because the group was thoroughly familiar with it; however, the study's conclusions and recommendations are applicable to many other scenarios involving a comparable threat.

The second phase of the preliminary study dealt with the actual elements creating vulnerabilities that allow the enemy to attack artillery components; i.e., emissions (radio frequency and infrared), movement, and firing. Each of these poses a different threat to survivability and must be weighted separately and yet considered in combination if viable conclusions are to be drawn. A detailed examination was made of our operational methods that allow enemy acquisition by one or more of his systems; i.e., signal intelligence (direction finding), side looking airborne radars, photographs, human intelligence collections, flash, counterbattery radars, moving target locating radars, electronic intelligence, and sound. The group members had to determine the specific capabilities of each threat acquisition system and then discover exactly what our vulnerabilities are. They could then propose measures to lessen our vulnerability or to disrupt the capabilities of the enemy's systems.

The group also reviewed the enemy's targeting procedure—processing, correlating, prioritizing, evaluating capabilities, fire orders, and fragmentary orders—to understand the mechanism that raises and lowers our vulnerability threshold. They reviewed the Soviet's attack assets—tactical air, attack helicopters, dismounted infantry (SPETZ-NAZ), field artillery, rockets, missiles, armor, and mechanized infantry—to identify specific vulnerabilities related to each type of attack and to investigate methods that would enhance a unit's ability to survive. They learned that although Soviet tactics call for a massive counterbattery strike in the magnitude of 600 rounds within two hectare boxes, the enemy cannot do this all the time against every identified target. He must concentrate his efforts in accordance with his scheme of maneuver. They also realized that each of the means of attack has some characteristics that are similar and some that are unique; therefore, methods for countering the potential effect of each attack capability has to be considered. For example, against tank and motorized infantry, traditional battery perimeters are almost useless; distant listening posts are the answer. However, some degree of close-in ground defense is required to defend against dismounted infantry.

The last step in the preliminary phase was to analyze how friendly vulnerabilities would be manifest; i.e., what effects would the loss of personnel, C^3 (command, control, and communications), critical equipment, and loss of mobility have on an artillery unit. The group understood, for example, that a solution that reduces the vulnerability of critical equipment might well prevent accomplishment of the fire support mission because it involves a reduction in mobility.

Stage Two

During second stage of the study, the group sifted through all the facts and determined that there are three basic tactics of survivability: dispersion, movement, and hardening. Any one method or a combination of all three methods is enhanced by the use of electronic warfare, camouflage, deception, local security, and other methods. Several initial conclusions regarding dispersion and hardening emerged during this stage.

Unit location is a primary consideration. It is not possible to have an infinite number of moves at random when the terrain has finite limitations. When one considers probable casualties and the number of personnel needed to make ammo runs, go to the trains, do administrative tasks plus the casualties, there is a dearth of soldiers to accomplish all the mission-essential tasks. This situation is exacerbated by dispersion of field artillery units over a large area. It takes time to wire everything into a net and time to keep it policed and repaired. And although present-day communications and electronic equipment is far better than earlier generations, it still does not meet the need in terms of capability and quantity. To survive we must be able to pass digital data to the gun line by radio, and we need several short-range inexpensive, pocket-size radios to provide local warning nets.

The group found that battery commanders and executive officers are not going to survive in jeeps or other soft-skinned vehicles. This prevailing situation in our units could cause the loss of highly skilled leaders, C^3 critical equipment (radios), and mobility. The crews of the 8-inch M110 howitzers are also extremely vulnerable while firing or moving, nor does our current equipment provide adequate protection for ammunition. The fielding of the field artillery ammunition support vehicle (FAASV) will largely remedy the latter situation.

Stage Three

Stage Three of the study was primarily a detailed examination of the three basic tactics used to increase survivability: dispersal, movement, and hardening.

Communication vulnerabilities remain one of the greatest concerns of survivability planners.

● Dispersal enhances the friendly force's ability to avoid detection, decreases the effects of counterbattery fire, causes a higher expenditure of enemy ammunition, and minimizes the effects of nuclear strikes. Dispersal complicates C^3, speed of occupation, security, logistic support, response to NBC attack, 24-hour operations, and battery cohesion. The optimal level of dispersion is dependant upon, and ideally determined by, an analysis of the factors of METT-T (mission, enemy, troops, terrain, and time).

Using the 16 different considerations described in figure 1, the group analyzed the doctrinal dispersal spectrums portrayed in figure 2. The results of this analysis appear in figure 1. Although the application of the factors of METT-T might well shift the ranking attached to each consideration in a given situation, figure 1 does illustrate the relative pros and cons of the three dispersal patterns used. It underscores the conclusion that one always pays a price for the benefits gained through dispersal.

● There are two types of movements: movement in response to tactical requirements and movement of platoons or batteries principally to thwart acquisition and delivery of counterfire. Regardless of the type of movement, there always is a price that must be paid for displacing often: degradations in firing capability, troop performance (resiliency), C^3 (especially with TACFIRE), firing accuracy (survey requirements), logistic support, security, and air defense capability. Batteries can "surge" by moving every two to four hours for 36 to 48 hours, but a realizable sustained rate is at best two to three moves daily. Firefinder radars must also move to survive; they can sustain two to three moves daily subject to mobility and equipment durability. Tactical operations centers (TOCs) should move one or two times daily to thwart acquisition and targeting. When TOCs are moving, they are out of touch with the situation, and for every move one must consider breakdown, movement, and regeneration time. Using four hours as an average total time required for movement, a battalion or division artillery TOC would be in operation only eight hours a day. The more moves the TOC makes, the less attention is paid to deception and to the adequacy of the camouflage efforts. When we move often, we tend to forget such details as "erasing our tracks," and thus reduce or eliminate the effectiveness of any other part of our camouflage. Another point relative to moving units that we sometimes forget is that the IMMEDIATE ACTION STATUS depends on the maneuver commander's orders and intent, not on the artillery unit's desire or need to move.

	Dispersal considerations	Case		
Priority	**Significant factors**	**1**	**2**	**3**
1.	Counterfire durability	–	±	+
2.	Command and control and fire direction	+	±	–
3.	Reconnaissance time	+	–	–
4.	Survey requirements	+	–	–
5.	NBC defense capability	+	±	–
6.	Security	+	±	–
7.	Counter side-looking airborne radars	–	±	+
8.	Agility	±	+	–
9.	Air defense	+	±	–
10.	Sustained operations	+	–	±
11.	Internal communications	+	±	–
12.	Position occupy time	±	+	–
13.	Location coordinates	+	±	–
14.	Cohesion	+	±	–
15.	Level of training	+	±	–
16.	Logistic support	+	±	–
Totals (maximim available fires)		**+ 14**	**13**	**3**
		– 4	**14**	**14**

Figure 1. Dispersal considerations.

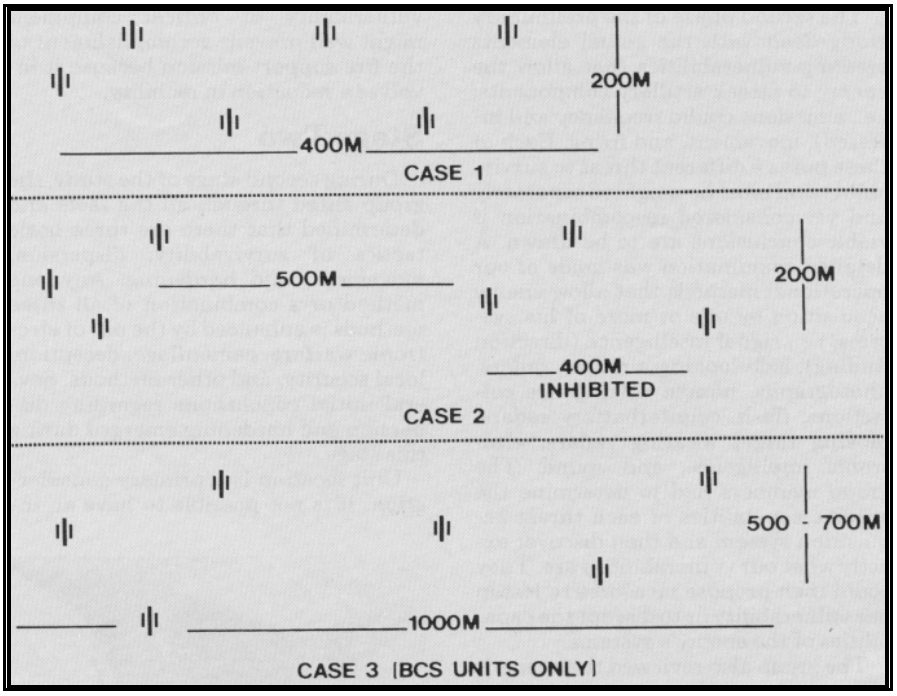


Figure 2. Doctrinal dispersal spectrums.

● Hardening includes digging in, building parapets, or occupying built-up ares to increase protection. It takes time to harden a position, and it takes resources. Training area and property owners demand that pits be refilled before the unit leaves. This is more useless work which is not realistic! During training, maybe we do not need to dig holes; perhaps detailed planning regarding what must be accomplished and a collective discussion within the unit as to what methods can achieve the objective are sufficient. Such discussions might lead our soldiers to realize that expedient methods and any available engineer support can be used to good effect and shallow trenches afford cover for personnel. Battery leaders might recognize that placing fire direction centers, battery operations centers, and ammunition carriers in natural defiles protects critical equipment and that revetting the wheels on vehicle protects mobility.

Conclusions

The action group's study led them to a number of conclusions.

First, survivability can be best enhanced

Dispersal considerations		Case		
Priority	**Significant factors**	**1**	**2**	**3**
1.	Counterfire durability	–	±	+
2.	Command and control and fire direction	+	±	±
3.	Reconnaissance time	+	–	–
4.	Survey requirements	+	+	±
5.	NBC defense capability	+	±	–
6.	Security	+	±	±
7.	Counter side-looking airborne radars	–	±	+
8.	Agility	±	+	–
9.	Air defense	+	±	–
10.	Sustained operations	+	+	+
11.	Internal communications	+	±	+
12.	Position occupy time	±	+	±
13.	Location coordinates	+	±	–
14.	Cohesion	+	±	±
15.	Level of training	+	±	±
16.	Logistic support	+	±	–
Totals (maximim available fires)		**+ 14**	**15**	**10**
		– 4	**6**	**12**

Figure 3. Adjusted dispersal considerations.

in the near-term by a combination of one or more of the following techniques:

- Dispersal of firing elements either by platoon (division artillery units organized by J-series TOE are more capable than corps units) or by an extraordinary battery position (BCS-equipped only) area which is 500 by 1,000 meters.
- Movement of firing elements and Firefinder radars two or three times daily and TOCs once or twice daily.
- Hardening of position by digging in, occupying built-up areas, and providing M113s in the firing batteries.

Second, current practices and MTOEs inhibit our ability to further enhance survivability. Dependence on wire inhibits application of many survivability tactics; and the lack of chain saws, ammunition protective blankets, and other necessary equipment reduces protection. Corps units need a second fire direction center with BCS for platoon operations in the extraordinary dispersed mode. The redundancy and flexibility provided by a second FDC is essential.

Third, the commander's concept of operations must direct the use of all means for attack and destruction of Threat field artillery, not just friendly counterfire.

Recommendations

Most of the study group's recommendations fall into two general categories: training -doctrine and equipment.

Training and doctrine

- Army Training and Evaluation Programs (ARTEPs) should be modified to include such tasks as performing platoon operations in a four- to six-hour period, digging-in key weapons and systems, occupying built-up areas, and occupying 500- by 1,000-meter position areas.
- Howitzer crews should be trained to operate totally within hardened vehicles.
- Commanders should direct that special weapons be brought forward only immediately prior to execution of a nuclear mission. Field storage locations should be at the battalion trains.
- Commanders should promulgate target engagement guidance that favors battalion volley rather than battery volleys.
- Appropriate higher echelon leaders should coordinate the establishment of doctrinal requirement to harden field artillery batteries.
- Commanders should concentrate cannon fires on the close-in battle.

Equipment

Do immediately:

- Field the AN/PRC-68 linked with the gun display unit.
- Provide hardened vehicles for the battery operations center, battery commander, and medics (M113s).
- Provide a second fire direction center to each battery.
- Provide additional aiming circles.

Near-term:

- Add Kevlar to the M548 and M110A2.
- Procure engineer earthmoving equipment capable of hardening positions.
- Add PADS to the battery operations center and the battery commander's M113.

Mid-term:

- Improve the mobility and durability of Firefinder radars.
- Develop an urban camouflage system for tactical operations centers. The 17th FA Brigade is experimenting with a type of camouflage that allows TOCs to blend in with urban silhouettes.
- Develop a follow-on system to the AN/PRC-68.
- Field the howitzer extended life program (HELP) on schedule.
- Extend a self-positioning capability to the M110A2.
- Add a radio to the M110A2.
- Provide remote communications emitters. (The group recommends that the Signal Corps develop a method of remoting only the antenna as opposed to the current system.)

Without altering the priorities, the group applied the immediate fixes to its analysis of the dispersal considerations shown in figure 2. The results appear in figure 3.

The artillerymen of the action group did not consider themselves any more expert on this critical subject than other artillerymen. Nor did they pretend that they had discovered any original solutions. Rather they generated the results as an aid to help in the continuing effort to ensure that artillery will survive the Threat to provide an essential ingredient to combat power. The procedures, conclusions, and recommendations they developed may serve other Redlegs who choose to investigate the challenging issue of survivability.

Colonel Robert B. Adair, FA, is a graduate of LaSalle University. He has a Master's Degree in history from Niagara University and has completed both the Armed Forces Staff College and Army War College. Colonel Adair's staff tours include an instructorship at the United States Air Force Academy as well as assignments at TRADOC and DA. He commanded the 1st Battalion, 18th Field Artillery, and was the Commander of the 17th Field Artillery Brigade when he wrote this article.

The study group is indebted to Brigadier General Donald E. Eckelbarger for providing the stimulus to the project and to Lieutenant General John R. Galvin, VII Corps Commander; Major General Crosbie E. Saint, Commanding General of the 1st Armored Division; and Colonel William R. Crossly, V Corps Artillery Commander, for taking time to review the briefing and provide critical comments. Furthermore, a vote of thanks goes to Colonel Roger K. Bean, 3d Infantry Division Artillery Commander; Colonel Roger L. Bernardi, 1st Armored Division Artillery Commander; and Colonel Jerome H. Granrud, 210th Field Artillery Brigade Commander, for their efforts in reviewing the study and providing excellent input. I would be remiss if I failed to give credit to my operations officer, Lieutenant Colonel Marvin Wooten, Jr., who conducted the study and produced the results.

Redleg Newsletter

ITEMS OF GENERAL INTEREST

Officer Field Artillery Branch Team

Mailing address: Commander, MILPERCEN
ATTN: DAPC-OPE-F
200 Stovall Street
Alexandria, VA 22332-0400

Telephone: AUTOVON 221-0116/01118/0187/7817
Commercial: (202) 325-0116/0118/0187/7817

LTC Bill Ott Field Artillery Branch Chief

MAJ(P) Lee Outlaw Lieutenant Colonel's Assignment Officer

MAJ Jim Nyberg Major's SC13 Assignment Officer

An officer may request his official file by writing to MILPERCEN, ATTN: DPAC-MSR-S, 200 Stovall Street, Alexandria, VA 22332-0400. Include name, rank, SSN, and mailing address.

MAJ Larry Byrd Major's Additional Specialty Assignment Officer

CPT(P) Steve Curry Captain's Additional Specialty/Nominative Assignment Officer

CPT(P) Tim Baker Captain's SC13 Assignment Officer

MAJ John Biggs Military Schools/Lieutenant's Assignment Officer

CPT Frank Elizondo Accessions/Lieutenant's Assignment Officer

An officer may request performance fiche, service fiche, and ORB. The Field Artillery Branch has assumed the responsibility for official file review during a MILPERCEN visit (this is a change from last year). An officer may now visit his assignment officer and review his OMPF with only one stop; however, he must notify the assignment officer at least 72 hours prior to his visit so that the assignment officer will have his OMPF available.

Enlisted Field Artillery/Air Defense Artillery Branch Team

Mailing address: Commander, MILPERCEN
ATTN: DAPC-EPK-A
2461 Eisenhower Avenue
Alexandria, VA 22331-0400

Telephone: AUTOVON 221-8051/0304/0305/8038
Commercial: (202) 325-8051/0304/0305/8038
Note: Reclassification questions should be directed to extension -0276.

LTC Harry R. Yarger Chief, FA/ADA Branch

CPT Richard E. Bedwell Senior Career Advisor FA/ADA Branch

MSG(P) Arthur Tate Senior Professional Development NCO FA/ADA Branch

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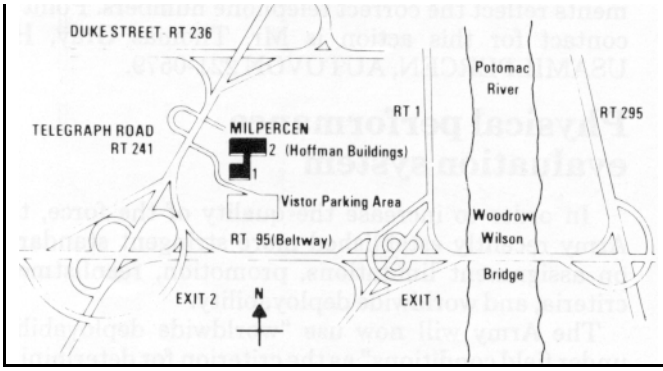
MSG Wayland M. Farley Career Advisor FA/ADA Branch

SFC Eldon W. Station Professional Development NCO, FA/ADA Branch

SFC Samuel Powell Professional Development NCO, FA/ADA Branch

SFC Henry L. Brown Career Advisor FA/ADA Branch

SFC Stanley L. Davis Career Advisor FA/ADA Branch



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Telephone: AUTOVON 693-7871/7873/7351. (Commercial toll-free numbers are listed below for each personnel management officer.)

Personnel management officers manage Reserve Components officer personnel according to grade and the last two digits of a person's social security number (SSN). The personnel management officer asists in obtaining assignments for individuals to a Reserve Components unit in an individual's locale. If such an assignment is not available, the personnel management officer explains Reserve Components participation options and arranges appropriate training to keep the individual active and qualified as a Reserve Components officer.

LTC James Stumpf
Field Artillery
Branch Chief
All Lieutenant Colonels
1-800-325-4952

MAJ Daniel
Kohner Captains
with last two SSN
digits of 50-99
1-800-235-4898

MAJ Wendell Long
All Majors
1-800-325-4899

CPT Tom Guerrant
Captains with last two
SSN digits of 00-49
1-800-325-4952

MAJ Gerald Lee
All Lieutenants
1-800-325-4950

Army Reserve Personnel Center

The Army Reserve Personnel Center (ARPERCEN) was activated 3 February 1984 to provide more effective and responsive management for members of the Army Reserve. The Officer Personnel Management Directorate (OPMD) of ARPERCEN maintains management files on all Army reserve officers. Within the Combined Arms Division of OPMD, the Field Artillery Branch provides the following management services for all Reserve field artillery officers who are not on active duty and who reside in the continental United States:

- Monitors all assigned Reserve officers throughout their careers.
- Provides a point of contact for assistance and information.
- Provides assistance to officers of the Individual Ready Reserve by arranging readiness training tours, schooling, and other training opportunities.
- Furnishes information about troop program units, including assignment opportunities and other means of participation in the Army Reserve.
- Assists Reserve units in filling vacancies.
- Provides Reserve officers to other Army agencies for tours of temporary duty such as annual training site support, exercises, and schools.

All Reserve officers are encouraged to contact their personnel management officer at least twice each year to advise him of their status, availability for training, address, and phone number and to obtain current information on training opportunities in the Army Reserve. (LTC James Stumpf)

Personnel Assistance Points

The US Army Military Personnel Center MILPERCEN operates seven personnel assistance points (PAPs) located at major airports throughout the United States. The PAPs are charged with providing logistical and administrative support and assistance to transient Army sponsored passengers en route to or from overseas areas. Travel documents and leave forms should list the telephone number of the appropriate personnel assistance point.

The following is the most current listing of personnel assistance points and their locations, telephone numbers, and areas of responsibility:

PAP	Serves	Phone No.
John F. Kennedy New York, NY	Kennedy International Airport, Washington National Airport, and Dulles International Airport	(718) 917-1698/9 AV: 232-4304
Philadelphia International Airport, PA	Philadelphia International and Baltimore-Washington International Airport	(215) 897-5649 AV: 443-5649
Charleston AFB, SC	Charleston Air Force Base	(800) 554-3210 AV: 583-3210/4141
St. Louis, MO Oakland, CA	St. Louis International Airport Oakland International and Los Angeles International and Los Angeles International Aiports	(800) 325-1680 AV: 693-6253/4 (415) 635-8452 AV: 859-2231/2580
San Francisco, CA Seattle, WA	San Francisco International Airport Seattle-Tacoma International (This airport was previously referred to as Henry M. Jackson International)	(415) 877-0715/0273 AV: 859-2017 (206) 243-5521/2 AV: 357-4502

Note: MILPERCEN does not staff operations at Baltimore-Washington, Washington, Dulles, or Los Angeles International Airports. Travelers requiring assistance should contact the appropriate PAP telephonically.

Army sponsored passengers en route overseas from an airport other than those listed above should have their travelope and leave documents annotated as follows:

- If traveling to the Carribean or Central or South America, the traveler should call the PAP at Charleston.

- If traveling to any area in the Pacific or Far East, the traveler should call the Oakland PAP.

- If traveling to any area in Europe or the Middle East, the traveler should call the PAP at John F. Kennedy International Airport.

Individuals who are port called through Los Angeles International Airport requiring assistance should call the PAP at Oakland International Airport—collect.

On 1 October 1984 the Personnel Assistance Point located at McGuire Air Force Base, New Jersey, moved to the Philadelphia International Airport. This move is in conjunction with the military airlift command's realignment of its passenger channel from McGuire to Philadelphia.

It is imperative that "travelopes" and leave documents reflect the correct telephone numbers. Point of contact for this action is Mr. Thomas Gray, HQ USAMILPERCEN, AUTOVON 221-0579.

Physical performance evaluation system

In order to increase the quality of the force, the Army recently established more stringent standards on assignment limitations, promotion, reenlistment criteria, and worldwide deployability.

The Army will now use "worldwide deployability under field conditions" as the criterion for determining physical fitness. Consequently, the policy for determining physical fitness and disability has required modification to support these new standards.

In the past, worldwide deployability criterion had not necessarily been a major limiting factor in determining physical fitness. However, because of the Army's worldwide commitments resulting in almost half of the force being assigned overseas, coupled with strength limitations, all soldiers must be physically fit and ready to perform the full range of duties required of their office, grade, and rank. Applying this new policy will ensure that each soldier serves his fair share of overseas duties and is fully deployable in the event of mobilization.

The Military Personnel Center (MILPERCEN), in coordination with the Deputy Chief of Staff for Personnel, Department of the Army, the Surgeon General, and the Commander of the US Army Physical Disability Agency (USAPDA), has developed a system to evaluate and consider appropriate disposition of soldiers who have medical conditions or physical impairments.

Effective 1 July 1984, Army Regulation 600-60, *Physical Performance Evaluation System* (PPES), evaluates all soldiers—enlisted, warrant, and commissioned officers—by establishing an MOS Medical Retention Board (MMRB) at the General Courts Martial Convening Authority (GCMCA). The MMRB will provide field commanders a more definitive and effective system for determining soldiers' capabilities to meet the physical requirements of their grade, MOS, or specialty code. All soldiers possessing a permanent "3" or "4" in their physical profile will automatically be referred to the MMRB, even if the soldier was previously found fit by the USAPDA.

The board will recommend appropriate action regarding the soldiers whose records are reviewed. This could include retention, change of MOS or specialty, probation for six months, or referral to the USAPDA system.

Soldiers with long service who possess unique skills and who are found unfit may be continued on active duty if it is in the best interest of the Army and the soldier as deemed by the Commander, MILPERCEN.

Command Update

NEW REDLEG COMMANDERS

Active Army

COL Rufus B. Rogers
3d Armored Division Artillery

COL Ronan I. Ellis
17th Field Artillery Brigade

COL Barnwell I. Legge
72d Field Artillery Brigade

LTC Vollney B. Corn
1st Battalion, 3d Field Artillery

LTC Bobby G. Rich
2d Battalion, 10th Field Artillery

LTC Stephen W. Hickok
6th Battalion, 29th Field Artillery

LTC William E. Borland
5th Battalion, 41st Field Artillery

MAJ (P) Michael K. Evenson
1st Battalion, 77th Field Artillery

LTC William D. Waller
6th Training Battalion
Fort Sill, Oklahoma

Reserve Components

The following is a list of US Army National Guard and Reserve commanders as 1 November 1984.

Army National Guard

I Corps Artillery
BG James M. Miller
1-140—LTC John R. Cox
1-145—LTC Donald M. Ewing
2-222—LTC Randy J. Ence

26th Infantry Division Artillery
COL Joseph R. Austin, Jr.
1-101—LTC Santo L. Bonaccorso
1-102—LTC Louis R. Berube
2-192—LTC Robert J. Weitzel
1-211—LTC Richard A. Barcelo

28th Infantry Division Artillery
COL Elton D. Reep
1-107—LTC Raymond D. Faczan
1-108—LTC Clarence A. Bricker
1-109—LTC Joseph F. Perugino
1-229—LTC William C. Rischar

38th Infantry Division Artillery
COL Donald D. Cox
1-119—LTC Howard A. Becker, Jr.
3-139—LTC David L. Huffman
2-150—LTC James H. Lee
1-163—LTC David M. Burgett

40th Infantry Division Artillery
COL Edgar B. Morrison
1-143—LTC James E. Bouchell
1-144—LTC James P. Lowsley
2-144—LTC Stephen A. Tyler
3-144—LTC Eugene W. Schmidt

42d Infantry Division Artillery
LTC(P) Nathaniel James
2-104—LTC William Horvath
1-105—LTC Donald Roberts
1-187—LTC William P. Kiley
1-258—LTC John T. Ruggiero, Jr.

47th Infantry Division Artillery
COL Kenneth B. Digre
2-123—LTC Robert O. Fitch
1-151—LTC George H. Jordan
1-175—LTC John P. Pedersen
1-194—LTC Jerry L. Gorden

49th Armored Division Artillery
COL Reynaldo Sanchez
2-131—LTC Walter D. Counts
1-133—LTC John Avila, Jr.
3-133—LTC James C. Harvie
4-133—LTC William J. Kelly, Jr.

50th Armored Division Artillery
COL Richard S. Schneider
1-86—LTC Harold M. Goldstein
1-112—LTC George A. Bannon
3-112—LTC George J. Blysar
4-112—LTC Thomas J. Sitzler

45th Field Artillery Brigade
COL Tommy G. Alsip
1-158—LTC Kenneth W. Bray
1-171—LTC Jackson H. Adams
1-189—LTC Robert A. Cruce

57th Field Artillery Brigade
COL Lawrence P. Kaplan
1-121—LTC Marvin I. Strawn
1-126—LTC James W. Holmes

103d Field Artillery Brigade
COL Cyril E. Frost, Jr.
1-103—LTC James F. Ryan
2-103—LTC Richard J. Valente

113th Field Artillery Brigade
COL James R. Martin
4-113—LTC Paul W. Sexton
5-113—LTC Stanley W. Brown

115th Field Artillery Brigade
COL Henry Castillon
1-49—LTC Kenneth R. Schofield
3-49—LTC Donald R. Enders

118th Field Artillery Brigade
COL Elton F. Hinson
1-214—LTC Paul L. Rushing
2-214—LTC Jordan B. Gaudry

130th Field Artillery Brigade
COL Joseph H. Wolfenberger
2-130—LTC John W. Mitchell, Jr.
1-161—LTC Malen E. Dowse

135th Field Artillery Brigade
COL Dale L. Strannigan
1-128—LTC Elbert F. Turner, Jr.
1-129—LTC James Wakeman

138th Field Artillery Brigade
COL Julius L. Berthold
1-623—LTC Walter R. Wood

142d Field Artillery Brigade
COL Richard L. Holt, Jr.
1-142—LTC James R. Pennington
2-142—OTC Bobby H. Armistead

147th Field Artillery Brigade
COL Jacob J. Krull
1-147—LTC Ernest T. Edwards
2-147—LTC Michael H. Hansen

151st Field Artillery Brigade
COL Louis C. Addison
3-178—LTC Claude W. Boone
4-178—LTC John B. Duffie

153d Field Artillery Brigade
COL Benny P. Anderson
1-180—LTC Warren Kurtz, Jr.
2-180—LTC Manuel Davila

169th Field Artillery Brigade
COL Marion A. Carmickle
1-157—LTC Gerald G. Neel
2-157—LTC Jesse T. Stacks III

196th Field Artillery Brigade
COL Carl E. Levi
1-115—LTC James S. Pack
1-181—LTC Jackie T. Rose

197th Field Artillery Brigade
COL Francis E. Merrill
1-172—LTC Alan R. Young
2-197—LTC Charles E. Hanson
3-197—LTC Rene J. Ferland

209th Field Artillery Brigade
COL Joseph N. Brill
1-156—LTC Glenn W. Losel
1-209—LTC Austin D. Nixon

224th Field Artillery Brigade
COL Franklin D. Simmons, Jr.
1-111—LTC Wiley F. Hughes
2-111—LTC Daniel B. Wilkins

227th Field Artillery Brigade
COL Eugene M. Bass
1-1167—LTC James R. Shoemaker
3-116—LTC John C. Bridges

631st Field Artillery Brigade
COL James H. Powell, Jr.
1-114—LTC James H. Lipscomb III
4-114—LTC Carl B. Cooper

Separate Units
2-110—LTC J. Donald Hanies
1-113—LTC Robert A. Collins
2-114—LTC Johnny B. McRaney
3-115—LTC Jerry Wyatt
2-116—LTC Clement E. Petters
1-117—LTC Ira K. Jones
2-117—LTC Joel W. Norman
3-117—LTC Harold K. Logsdon
1-120—LTC Ernest Woorster
2-122—LTC Walter J. Whitfield
1-125—LTC David W. Larson
1-127—LTC Robert E. Dunn
1-136—LTC John T. Donnellan
2-138—LTC Earl L. Doyle
1-141—LTC Rene C. Jacques
2-146—MAJ(P) Michael S. Croy
1-152—LTC Gregory A. Ward
1-160—LTC Dale E. Carney
1-162—LTC Raul O. Barreras
2-162—LTC Ernesto A. Ramos
1-168—LTC Wesley D. Tlustos
1-178—LTC Harry J. Vann
1-182—LTC Arno Rabin
1-201—LTC John L. McCabe, Jr.
5-206—LTC Roy L. Rowe
2-218—LTC David T. Connor
1-230—LTC Cecil L. Pearce
1-246—LTC Grover E. Scearce
1-487—LTC John K. Hao

United States Army Reserve

428th Field Artillery Brigade
COL Francis T. Mataranglo
4-20 —LTC William F. Motz
4-38 —LTC Stephen W. Dunkle
4-333—LTC George E. Dunn

434th Field Artillery Brigade
7-1 —LTC James P. Fergo
4-75—LTC Robert E. Grunewald, Jr.

479th Field Artillery Brigade
COL Robert R. Armstrong
4-8 —LTC Robert E. Burkett
4-92—LTC Edward H. Kuhar

Separate Units
5-5 —LTC Michael M. Jones
7-9 —LTC Charles H. Sadek
3-14—LTC Michael C. Archibald
3-15—LTC Paul D. Wharton
4-17—LTC Joseph A. Brake
5-28—LTC Jimmy E. France
3-42—LTC Martin W. Sayne
3-75—LTC Lee T. Cornelison
3-83—LTC Billy W. Keyes
6-83—LTC Wallace W. Reynolds
3-92—LTC George A. Fromholtz

Marine Corps Commanders

1st Marine Division Artillery

Col George L. Cates
11th Marine Regiment
LtCol Robert K. Redlin
1st Battalion, 11th Marine Regiment
LtCol Mark C. Bunton
2d Battalion, 11th Marine Regiment
LtCol John S. Snowden
3d Battalion, 11th Marine Regiment
LtCol Leslie M. Palm
5th Battalion, 11th Marine Regiment

2d Marine Division Artillery

Col Christopher Catoe
10th Marine Regiment
LtCol William H. Schopfel III
1st Battalion, 10th Marine Regiment
LtCol Joseph R. Welsh, Jr.
2d Battalion, 10th Marine Regiment
LtCol James M. Rapp
3d Battalion, 10th Marine Regiment
LtCol David W. Haughey
4th Battalion, 10th Marine Regiment
LtCol Richard I. Neal
5th Battalion, 10th Marine Regiment

3d Marine Division Artillery

Col George E. Gaumont
12th Marine Regiment
LtCol Robert D. Newlin
1st Battalion, 12th Marine Regiment
LtCol James T. Luken
2d Battalion, 12th Marine Regiment
LtCol Edward Hanlon
3d Battalion, 12th Marine Regiment

4th Marine Division Artillery

Col Torrence W. Rogers
14th Marine Regiment
LtCol Jack F. Perry
1st Battalion, 14 Marine Regiment
LtCol Charles R. Brooman
2d Battalion, 14 Marine Regiment
LtCol Donald F. Carey
3d Battalion, 14th Marine Regiment
LtCol Jerry L. Brown
4th Battalion, 14th Marine Regiment

OMG

by Mr. Bert Brown

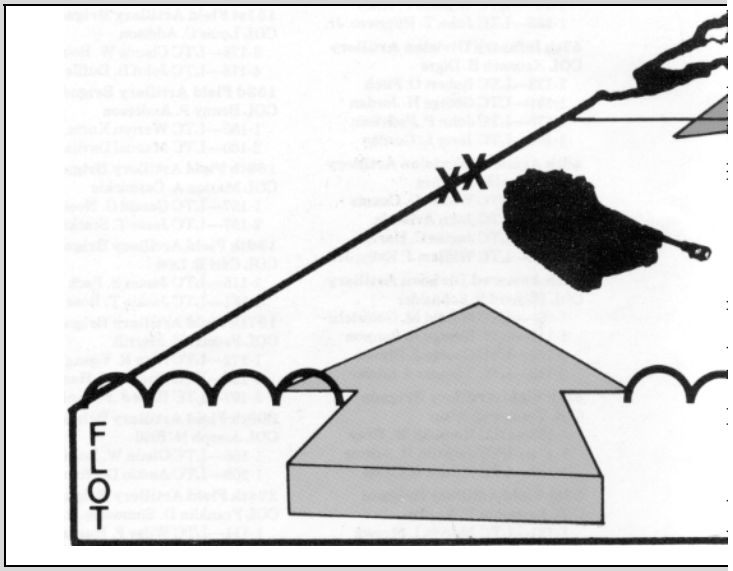
Major changes have been taking place in the Soviet Army organization, particularly in fire support units. These changes have taken place in conjunction with the emergence of what some authors have termed "Operational Maneuver Groups" (OMG)—a modern day version of Soviet World War II Mobile Groups which were used to pierce the echeloned German defenses on the Eastern front. Although a few experts have argued that the OMG is merely a disinformation ploy, most analysts believe it to be a division- or corps-sized formation which is heavily armed with a large number of tanks, mechanized vehicles, and other mobile conventional forces formed into combined-arms reinforced battalions. Doctrinally, it would appear during the first few days of a war in order to carry the battle to the "operational" depths of the enemy's defenses and to defeat the opponent quickly before he can use tactical nuclear weapons.

The evidence suggests that the OMG concept was revived about 1974, after the appearance of the Soviet's new divisional self-propelled artillery systems—the 122-mm 2S1 self-propelled howitzers (M-1974) and the 152-mm 2S3 self-propelled gun-howitzer (M-1973)—but before the introduction of such new army-and Front-level artillery systems as the 152-mm M-1976 towed gun and the 152-mm 2S5 self propelled gun M-1976. Analysts originally thought that the OMG would be an extra large division which would be used in special circumstances, but recent Soviet writings on the subject have changed their minds. These new doctrinal publications indicate that the OMG should have more mobility and flexibility than an ordinary division. Not only would it have more numerous armored vehicles, but also would have a larger amount of self-propelled artillery. Indeed, the OMG could conceivably have up to one battalion of artillery (18 to 24 guns) for each maneuver battalion.

Some analysts have suggested that the OMG is nothing more than a second-echelon force. This is simply not the case. The OMG has significantly different missions than a second-echelon formation. This can be seen by comparing the tasks of each. The missions of the second echelon are doctrinally defined as follows:

- To increase pressure on the main axis of attack and to break through any secondary defense zones.
- To repel counterattacks.
- To provide flank protection.
- To widen a breakthrough operation.
- To replace depleted first-echelon units.

An OMG, however, has much broader and ambitious missions which place the responsibility for maintaining the initiative on the formation commander. An OMG and its subelements will be used as a raiding



force to support the concept of total operation. Specifically, its missions are to:

- Drive into the enemy rear areas; destroy and disrupt nuclear delivery means, logistic support, and C^3 nets; and disrupt the enemy's ability to shift forces to meet a breakthrough.
- Destroy enemy reserves before they can be committed to the main battle.
- Pursue and destroy a withdrawing enemy force.
- Seize defensive positions before they can be occupied.
- Seize key economic or political targets.

Thus, the doctrine for an OMG is more flexible and dynamic. One US intelligence analyst has likened the OMG to pitchfork rather than spear because its multiple columns will drive on specific critical targets and thereby distract the opposition's attention and resources—reserves, ammunition, and aviation assets—from the main attack. The OMG has more potential for material and psychological destruction than the traditional second echelon force.

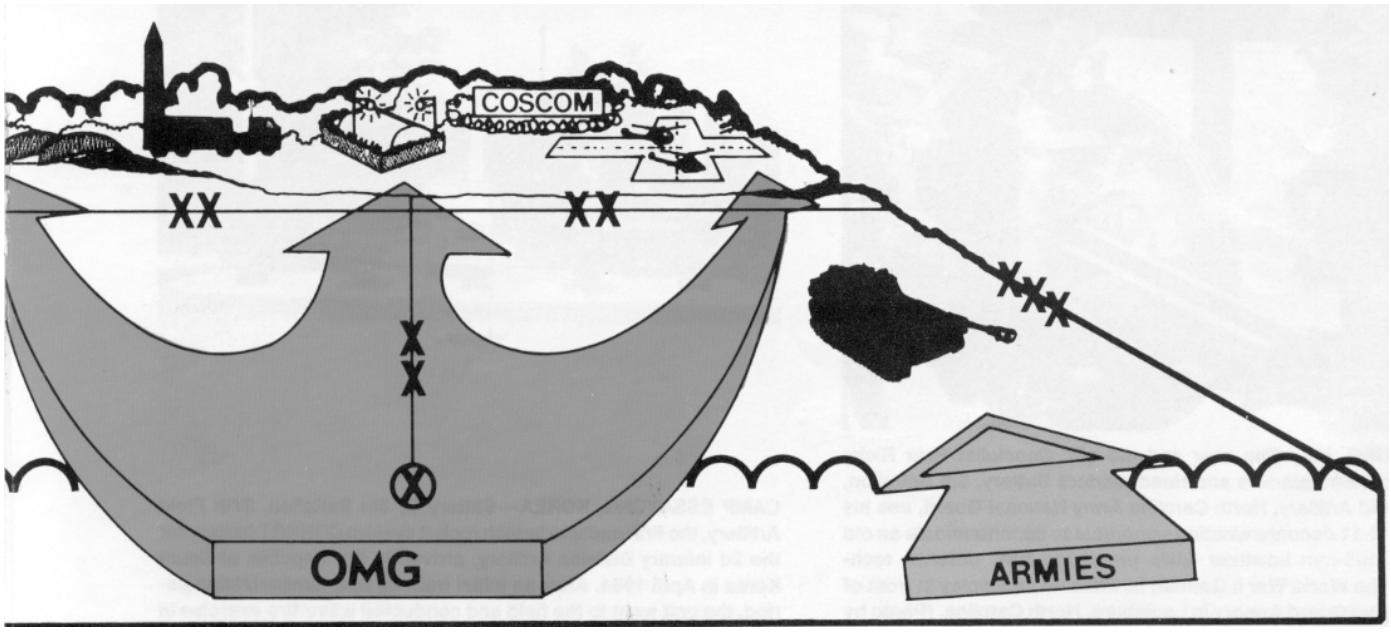
The implications of the OMG concept are ominous. The concept appears to redress some outstanding Soviet problems. For example, one of the curious aspects of Soviet artillery is that its long-range weapons may not be employed to their full range because of inadequate target acquisition. The BM-27 MRL (multiple rocket launcher) has a range of about 40 kilometers, but it is not known whether the Soviets can acquire targets at that range quickly enough to capitalize on such long-range systems. Their radar systems are limited, but the Soviets are improving them. Aerial reconnaissance and sound and flash capabilities are both well-developed but not very timely. To get accurate, up-to-date information, the Soviets would have to rely on radio reports from special purpose forces and their long-range reconnaissance patrols. The OMG concept, would of course, solve much of this problem.

When an OMG penetrates a gap in the opposition's lines, it could act as a giant reconnaissance in force and report back to the army or Front the locations of pockets of heavy resistance and of other important targets such as nuclear-capable artillery and missiles. The long-range guns and rockets of the army or Front could then engage these high payoff targets. As it travels in march formation farther into the opponent's rear, an OMG could also feed targeting data to SS-21s and other missiles traveling with the main body.

During its operation, the OMG would receive continuous aerial support from both fixed- and rotary-winged aircraft. Not only would the OMG have long-range cannon and missile systems supporting it, but it might also have self-propelled heavy artillery such as the new 240-mm M-1975 self-propelled mortar. This system could be allocated from the Front heavy artillery brigade to a Front OMG and be used for conventional close support in dealing with built-up areas.

The OMG exploits the potential of new equipment such as long-range cannons and self-propelled artillery to conduct raids; helicopters to insert heliborne troops at critical positions; and mobile air defense systems to provide protection while in the enemy's rear. Furthermore, by "hugging" its opposition in their rear areas it lobbies against escalation into the use of nuclear weapons. In short, an OMG is likely to have more of an impact on friendly field artillery operations and planning than any second-echelon force. Field artillerymen must be ever mindful of the ominous implications of this burgeoning threat.

Mr. Bert Brown is an Intelligence Analyst with the Directorate of Combat Developments at the United States Army Field Artillery School. He has an M.A. in history from California State University at Fullerton and spent four years in U.S. Air Force intelligence. He is a lieutenant in the Air Force Reserve with a mobilization assignment to the United States Air Force Europe.



Right by Piece

NOTES FROM UNITS

Soldiers from the 3-8th FA prepare to send a 155-mm round downrange. (Photo by LTC Arturo Rodriguez)

Thunderbolts are ready

FORT BRAGG, NC—The day is gray and damp. A CH-47 helicopter strains from the weight of the 7 1/2 ton M198 howitzer slung beneath it. Soldiers emerge from their concealed positions on the perimeter and rush into the swirling dirt and hurricane-like winds to emplace the M198 howitzer. As the helicopter descends, the soldiers wrestle the howitzer into position and unhook it. The helicopter quickly departs to pick up another load. Three minutes later the howitzer is ready to fire. In the meantime, the fire direction center contacts the forward observer and computes firing data by using emergency fire direction procedures. Suddenly, the stillness of the firing point is shattered by a thunderous shot from the howitzer—the first round in a time-plot registration goes downrange.

A scene similar to this one was repeated three times recently as the Thunderbolts of the 3d Battalion, 8th Field Artillery, conducted firing battery Army Training and Evaluation Programs (ARTEPs) to evaluate the state of training and combat readiness of each of its firing battery. This evaluation was especially important this year because the Thunderbolts were preparing to undergo the battalion-level ARTEP-based qualification test which, unlike previous ARTEPs, requires that the battalion attain certain minimum scores in tactical operations, gunnery, and nuclear missions.

Although the battery ARTEPs only lasted 36 hours, soldiers were evaluated closely on logistics and supply, maintenance, mess, gunnery, position occupation, nuclear operations, air movements, reaction to aggressors and NBC, communications, and numerous other individual and unit tasks.

Each Thunderbolt soldier hoped his battery would perform well, and everyone worked hard to achieve that goal. Battery A was judged to have performed the best overall, but only by a slim margin. Battery C achieved an impressive 94 percent accuracy in fire missions, while Battery B set the standard in air movement and nuclear operations. All three batteries proved they could accomplish the field artillery mission of moving, communicating, and, most importantly, providing timely and accurate fires in support of the maneuver forces. (CPT Al Mrozek)

LOUISBURG, NC—The new and the old: Specialist Four Ricky Fowler of Headquarters and Headquarters Battery, 5th Battalion, 113th Field Artillery, North Carolina Army National Guard, use his modern M-11 decontaminating apparatus to decontaminate an old German 105-mm howitzer while practicing NBC defense techniques. The World War II German howitzer is on display in front of the National Guard Armory in Louisburg, North Carolina. (Photo by CPT Floyd Whitney)

CAMP ESSAYONS, KOREA—Battery C, 6th Battalion, 37th Field Artillery, the first multiple launch rocket system COHORT battery for the 2d Infantry Division Artillery, arrived in the Republic of South Korea in April 1984. After an initial train-up and familiarization period, the unit went to the field and conducted a live-fire exercise in conjunction with a Republic of South Korea Honest John battalion.

CAMP STANLEY, KOREA—Members of the Salute Battery of the 6th Battalion, 37th Field Artillery, demonstrate their firing skills during Armed Forces Day activities. (Photo by Geary McSpadden)

FORT CAMPBELL, KY—Soldiers from the 2d Battalion, 31st Field Artillery, 101st Airborne Division (Air Assault), complete the final hook-up of an M198 155-mm howitzer for a practice raid across the forward edge of the battle area at Fort Campbell, Kentucky. (Photo by PFC Bill Powell)

GUENZBURG, WEST GERMANY—Sergeant Bernard Hamilton of the 36th US Field Artillery Detachment uses the drinking tube to drink water from his canteen at one of six stations on a timed nuclear, biological, chemical (NBC) course during the 512th US Army Artillery Group's NBC Olympics. (Photo by SP4 Tamara Richmond)

Training to survive

WEBSTER, SD—The 2d Battalion, 147th Field Artillery, South Dakota Army National Guard, was one of the first in the nation to complete successfully the requirements of Appendix C, FORSCOM Regulation 350-2. This occurred during Annual Training (AT) 83 at Fort Carson. Shortly thereafter, the battalion completed the requirements of a technical verification inspection (TVI). So for AT 84 the battalion staff wanted to put emphasis on survivability tasks and came up with some new ideas and developed some new training plans.

The name of every soldier in the battalion was placed in a box. Each evening, the battalion S1 drew eight names from each battery; these 40 individuals became casualties (killed in action) for the next day. From early in the morning until early the following day they were not available to their unit. What were the results of this action?

● Sustainability began to mean something. Each unit and section found out that they could function without key personnel. Without "good ole" sergeant or specialist or private so-and-so, they began thinking and getting the job done. They were not always as fast or efficient as their leaders and comrades but the junior enlisted men *did get the job done*.

● Cross-training became a reality. Our junior NCOs and specialists found themselves assuming positions of one and sometimes two grades above their own. Gunners sometimes had to become section chiefs overnight. Chiefs of firing battery discovered that they were the first sergeant for the next day. The cross-training was a huge success and will benefit individual soldiers and the battalion in the future.

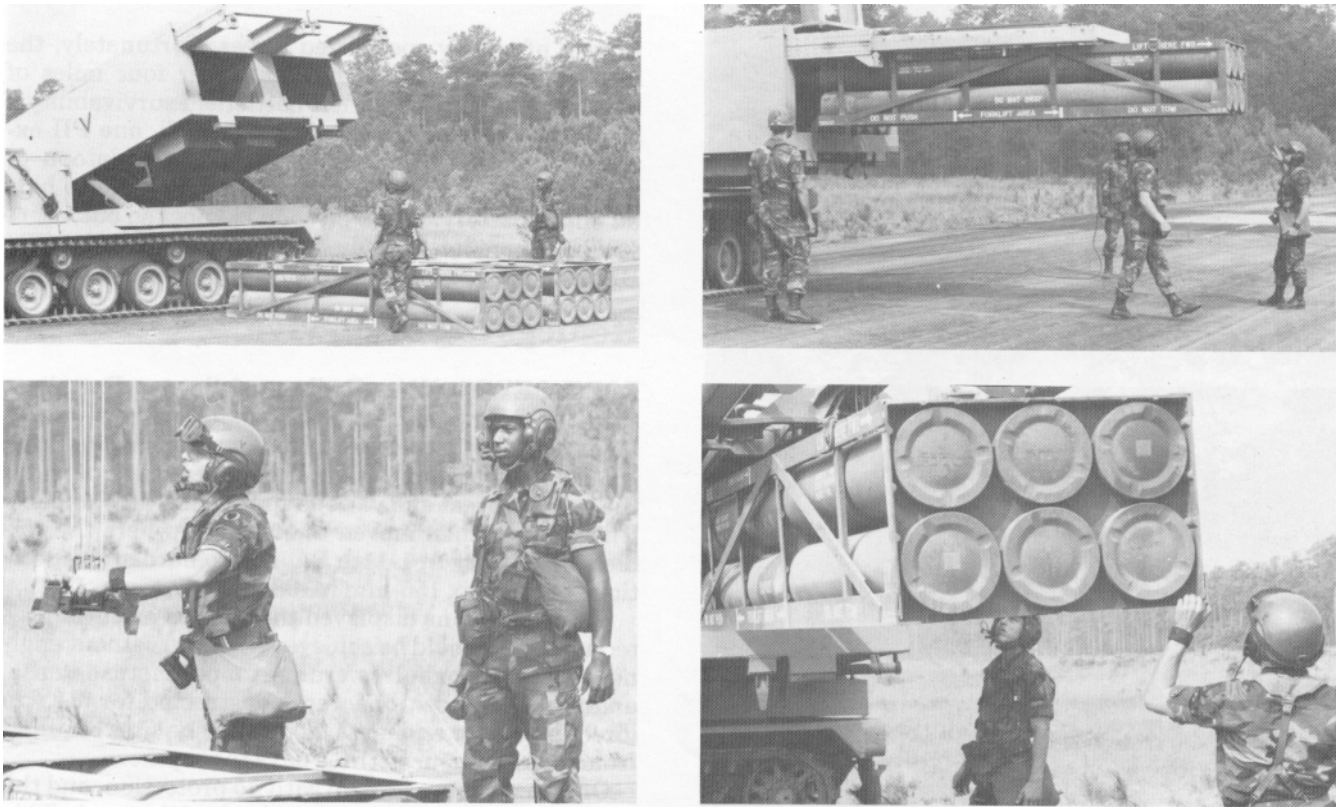
● Those 40 casualties (eight per battery) were taken from the unit for a period of 24 hours and became a 40-man OPFOR detachment. From 0700 to 1100 hours, they received instruction on infantry and small unit tactics. Personnel of the Infantry BAT from Fort Riley, Kansas, taught these individuals to become aggressors. Then from 1200 hours that day to about 0400 the next day they conducted OPFOR activities against the 2-147th FA, which used its training assistant and a couple of training NCOs as the "permanent party" for the OPFOR. No one at battalion knew when or where the OPFOR would strike. The OPFOR knew the battalion's plans, but the battalion staff didn't know theirs. At first, no one wanted to be on the OPFOR list, but by the end of the AT those who had not gotten the opportunity were wishing they had. The OPFOR worked both day and night and used blank ammunition and pyrotechnics.

The 153d Combat Engineers Battalion, South Dakota National Guard, were at AT 84 during the same time period, and its Company B worked exclusively with the OPFOR each day—setting up roadblocks, cribs, minefields, etc. Company A was assigned to the 2-147th FA—with a platoon assigned to each battery. When obstacles were encountered, the commanders learned to call on these expert engineer personnel and equipment to clear them. By the end of the two weeks, the commanders were integrating these combat engineers into our perimeter defense, calling on their leaders for their advise on positioning, defensibility, and many other combat engineer skills.

● The 147th FA Brigade wrote a scenario that incorporated ideas noted above and also placed other demands on our battalion such as NBC play. In accomplishing this training, however, the battalion could not forget its main mission—to provide fire power to the brigade. During the first week, nonpersistent chemical attacks were initiated which forced units into MOPP situations and necessitated moves. By the end of the second week, chemical attacks with simulated persistent agents occurred. Units had to go into a MOPP 4 status, complete certain missions, displace, and then be decontaminated. MOPP 4 was maintained up to six hours for some of the units.

The evaluator comments at the end of AT summed up the training during that period: "All training was conducted in a tactical environment, using a tactical situation. The unit used a KIA program to take key personnel out of action for a 24-hour period. These personnel received individual and collective training at another location."

"Training to survive" had become a reality, and that reality had become very challenging and rewarding. This type of training doesn't just happen. It takes a lot of planning, revising, and most of all a lot of hard work. The battalion could not have accomplished this extensive training without the wholehearted support and cooperation of the 147th FA Brigade and the 153d Engineer Battalion. (CPT Orville D. Roberts, 2-147th FA)



FORT STEWART, GA—Soldiers from Battery C, 1st Battalion, 13th Field Artillery, ended a week-long Army Training and Evaluation Program (ARTEP) with the firing of the multiple launch rocket system (MLRS). This was the first firing of the rocket system at Fort Stewart. In the top photo, Sergeant Walter Chevis (left) and Sergeant Bullard direct the loading bars over the rockets. Then Sergeant Chevis pulls down the guiding cable that loads the MLRS. At top right, the crew watches the loading process as Sergeant Chevis guides the live rockets into the MLRS, and Private Two Joseph Welch, the driver, watches for any malfunctions in the process. Then the rocket is on its way to a target. (Photos by PV2 Patrick Burke)

Surviving with Pershing II

FORT SILL, OK—An alarm blast shatters the silence; an inert camp springs to life. With practiced precision, soldiers scramble to their positions and unveil a massive, dormant missile. A computerized digital picture invades the weapon's computer system, and the firing chief shouts, "Clear the area!"

This was the scene on Friday, 19 October, as the only stateside Pershing II (PII) missile unit, Fort Sill's Battery A, 3d Battalion, 9th Field Artillery, participated in a 10-day survivability exercise alongside its two sister Pershing la batteries. The exercise, dubbed "Operation Autumn Thunder," was A Battery's first major tactical training since it was equipped with the Pershing II in late May. The remainder of the battalion is slated to convert to PII during 1985.

PII units in Europe can fire their missiles within 25 minutes after a release order is issued by the Army's European Headquarters. Within only 12 minutes, their missiles can hit a target 1,000 miles away. On the downward leg of its trajectory, each missile would lock onto a target with a newly developed radar system, which displays a picture of the target area, and would be guided into the target by specially designed fins.

PII is an entirely self-contained system; it has no umbilical cord that ties it to a central computer. It requires no central power source, and each missile can operate independently. In fact, each missile receives its power from diesel generators which can run for days using a single tank of fuel and which are much quieter than turbine engines.

Although Pershing units are usually deployed about 100 miles behind the frontline, they will be the primary targets of enemy specialized forces. Fortunately, the new PII missiles can spread out over four miles of terrain. This increases their battlefield survivability a hundredfold over P1a missiles. After all, one PII expert notes, "It is a lot easier to hide a platoon of vehicles and soldiers in one position than it is to hide an entire battery. If one platoon is knocked out, there will be others left to fight." (Story and photo by SP4 Brian E. Padget.)

Redlegs dig to survive

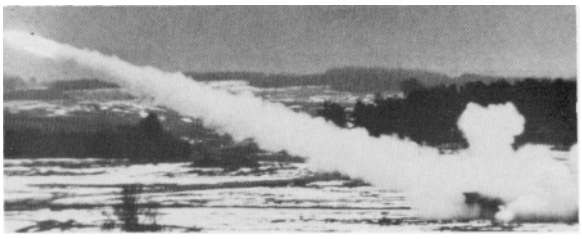
FORT LEWIS, WA—Redlegs of the 1st Battalion, 11th Field Artillery, learned how to survive on the modern battlefield last October. Training began with a 11/2-hour presentation which included video tapes on the enemy threat and various survivability techniques. The Redlegs then moved to Range 34 where the soldiers of Battery A, 1-11th FA, had to harden the positions of their six 155-mm M198 howitzers.

These positions displayed the various levels of protection which could be achieved with and without engineer support. Foxholes were dug for perimeter defense, and hardened positions were constructed for the fire direction center and mess facilities. The sites required from one-half hour to three days to prepare.

One howitzer was set up with no protection, and the crew worked directly out of the back of the truck. This type of site can be prepared in about one-half hour, but it can only be occupied for one or two hours in a high-intensity environment. Other positions were hardened by building a dirt berm, which gives a much better chance for survival. A direct hit would be necessary to destroy this type of site. Still other sites included sandbag bunkers for personnel, shells, and powder. Such a site would be constructed for relatively static support.

All the work in setting up the display areas was done by the Redlegs of Battery A. They spent three weeks digging positions and filling sandbags. In fact, they filled over 20,000 sanbags; 5,000 of these sandbags were used at one site alone.

Constructing a survivable site is time-consuming, but it is something that most soldiers have neither seen nor done. Environmental factors and costs often preclude this vital individual and collective training. The 1-11th FA personnel recognized this problem and are preparing a video tape which will capture this valuable training for future use and reference.



ANSBACH, WEST GERMANY—Redlegs of Battery C, 1st Battalion, 94th Field Artillery, take their new multiple launch rocket system to the field for live firing.

Members of the Veteran Corps of Artillery await the command to fire the Fourth of July Salute to the Nation at Battery Park, New York City.

Veteran Corps of Artillery

NEW YORK, NY—Our shores were unprotected; what little army we had was on the western frontier, too far away to be of any help in an emergency. The British were creating problems on the high seas, and there was a growing fear that they might attack New York once more. Under this kind of backdrop, the Veteran Corps of Artillery was born.

A group of officers and men of Washington's disbanded Army—many from the Second Regiment Continental Corps of Artillery—assembled at City Arms Tavern on Evacuation Day, 25 November 1790, in lower Manhattan and "voluntarily associated, constituted, and formed themselves into a separate and distinct Corps of Artillery of the State of New York, with such number of artillery companies as might from time to time be found desirable, the formation of such companies to be prescribed in the Act of 14 April 1786." This formation of 1790 has never been changed in the Corps.

Having chosen its officers, the Corps armed and equipped itself at its own expense according to the prescribed regulations of the Artillery of the United States Army in 1790; its officers were commissioned by the Governor. From 1790 to 1800, the Corps recruited 921 men who were organized into three regiments. Formal application for recognition as an independent Corps of Artillery was granted by George Clinton, Governor of the State of New York, on 16 February 1791. Records indicate that the Corps twice volunteered its services—first on 3 March 1803 and again on 19 October 1809—for the protection of its country and is on record as the first militia organization to volunteer its services.

On 25 June 1812, the Corps was mustered into Federal service and attached to the First Brigade of Artillery, New York State Militia, where it served "on call" until 2 March 1815.

On 17 September 1854, the Corps was declared to be a separate artillery Reserve brigade. Its commandant was given the permanent rank of brigadier general, and its vice commandant that of colonel. The Corps is comprehended under the National Defense Act as being one of nine historic military organizations liable for duty under orders of the President in time of war.

The Corps was given the option of choosing its own uniform; so, in 1900, it adopted the uniform to conform to the United States Army dress coat of 1812. This uniform is still worn today for ceremonial occasions.

As the oldest independent command in the state of New York, the Corps is afforded the position of Honor Guard for military parades in Manhattan and leads the Armed Forces Day parade up Fifth Avenue each year. On Independence Day, it fires a 50-gun salute to the Nation with its two 75-mm pack howitzers and participates in special events such as firing a 21-gun salute to the King and Queen of Spain when they visited Brooklyn in 1975. The Corps also serves as the military honor guard to the Governor on his request.

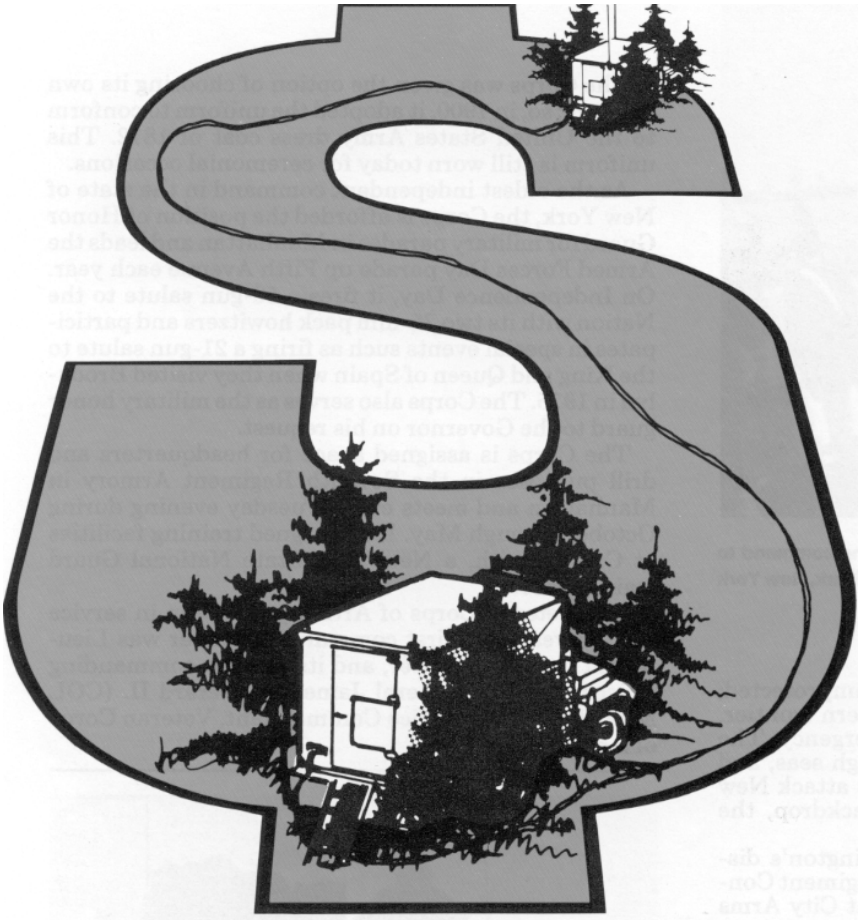
The Corps is assigned space for headquarters and drill purposes in the Seventh Regiment Armory in Manhattan and meets every Tuesday evening during October through May. It is assigned training facilities at Camp Smith, a New York State National Guard training site.

The Veteran Corps of Artillery has been in service for 194 years. Its first commanding officer was Lieutenant John Delamater, and its present commanding officer is Major General James W. Gerard II. (COL Malcolm G. Smith, Vice Commandant, Veteran Corps of Artillery)

FORT SILL, OK—The first of five pure Multiple Launch Rocket System (MLRS) battalions to be activated under the Army's Force Modernization Program was formed at Fort Sill on 1 October 1984.

Six MLRS batteries already support the Army's heavy divisions in the United States and Europe, but the new MLRS battalions will support corps. The new battalion—6th Battalion, 27th Field Artillery—is assigned to the 75th Field Artillery Brigade and will support III Corps Artillery which has its headquarters at Fort Sill.

Soldiers to man the new battalion are coming from field artillery units all over the world. It will take approximately one year to train personnel to man the new battalion's headquarters battery and three firing batteries. Each firing battery will have nine self-propelled launcher-loaders.



A Small Price for Survival

by Captain Thomas E. Hill

When my boss, the division artillery commander, called me into his office and told me that during REFORGER 84 he wanted all FM radios out of his tactical operations center (TOC) remoted to a distance of 800 meters, I swallowed hard and tried to talk him out of it. I argued that extra time would be necessary to run the remote lines to the TOC and install the remote site. I explained the inherent problems with the fragility of tactical wire lines and that the addition of an extra layer of hardware between the subscriber and the communications means would be drawbacks that would ultimately lead to failure. Nevertheless, he looked at his communications expert—me—and said, "Handle it!"

I was convinced that the disadvantages of such a concept would far outweigh the advantages. But I did what any good communications-electronics staff officer (CESO) would do, I proceeded to carry out the commander's orders. His objective was obviously twofold:

- To make the location of the TOC by Threat radio direction finding more difficult by placing the FM radio emitters out of the immediate area.
- To gain the ability to place the TOC almost anywhere within the 800-meter distance of the remoted communications location and thereby make valleys, defiles, and towns accessible for occupation.

The remoting of up to six FM nets over a distance of 800 meters requires the rethinking of the entire TOC operation and its communication support system. My commander did accept as a pre-condition one of the disadvantages of remoting; namely, the increase in the TOC's normal installation time of 15-30 minutes to 45 minutes or an hour. Even the expanded time limit required significant material, organizational, training, and procedural changes.

- An M880 vehicle had to be dedicated to carry a specially constructed rack of six radios and four Vinson secure devices. Thee six radios were used for the division artillery voice nets consisting of the division artillery command fire 1 (CF1) net, division artillery command fire 2 (CF2) net, division command net, and division operations and intelligence net, intelligence (radar) net, and the supporting artillery brigade CF1 net for liaison purposes. The remote vehicle was also equipped with a 60-ampere kit to generate 24-volt, direct current (DC) power directly from the vehicle engine. Its power production capability was augmented with a 1.5-kilowatt, 14-volt, DC generator which was connected directly to the vehicle batteries by jumper cables. The system could then be powered by the generator when the vehicle remained in one location for an extended period of time—usually more than four hours. To make the communications system completely operational, six RC-292 antennas and GRA-39 remote units were loaded on the vehicle. Two whip antennas were mounted on the M880 to allow it to operate in a mobile configuration and to provide limited distance operation on site while the RC-292 antennas were being erected.
- Two one-mile long, six-pair cables were constructed by taping together six one-mile strands of WD-1 wire. Each pair of cables was labeled to reflect which radio net it would carry. Each cable provided the capability to remote at least 1.2 kilometers in wire distance. The two cables would be carried forward and installed by the advance party when the TOC was about to move. This factor alone cut system downtime significantly.
- Two special teams were trained to handle the remote communications mission. Since the operation of the TOC's FM radios is not a communications platoon function, the division artillery operations section provided an FM radio operator team of two soldiers. This team received special training in the use of the Communications-Electronics Operation Instructions (CEOI) and in the specific function of each radio net that would be monitored in the team's remote vehicle. The team was also trained in the operation and troubleshooting of the FM radios as well as the Vinson secure devices and in the erection and cutting of the RC-292 antenna. Collectively, the brigade's leadership worked out a step-by-step drill for bringing the radios and remotes online as well as a procedure for the use of the generator and ancillary power

hook-up. The second team, a special wire element, consisting of a noncommissioned officer and two wiremen with vehicle and cable-laying equipment, was drawn from the communications platoon. This team received extensive training in the function of each of the radio nets for which it would be laying the remote cable and on proper wire-laying and tagging techniques. The special wire team was thoroughly briefed on where each radio net would be terminated and on its responsibility to install the remote cable to the GRA-39 local units in the appropriate van once the TOC arrived. This wire team always consisted of the same people and always went forward with the advance party to lay the spare remote cable. A wire retrieval team picked-up wire at the old TOC site and also retrieved the two-pair cables left behind when the TOC moved.

● Because there is a need for continuous operations during a major headquarter's displacement and because the remote vehicle carrying all of the TOC's radios had to remain with the TOC until it displaced, we established a jump TOC to move forward with the advance party and establish communication to maintain command and control while the main TOC was displacing. The jump TOC with its own radio equipment went forward to the new remote site—not the new TOC location—and set up two RC-292 antennas and communicated from there while the main TOC displaced. The remote vehicle moved with the main TOC, but pulled into position next to the jump TOC and used the two antennas already installed.

The division artillery tested and refined the operation of the remote system during two field training exercises. It worked beautifully. REFORGER 84, however, was to be the real test of success or failure.

Almost immediately after REFORGER 84 began, the relocation of the FM emitters began to pay off. Opposing forces tried to locate the division artillery TOC using direction-finding equipment and failed. The opposing forces' airstrikes were targeted against the remote location, thus sparing the TOC. Because the remote site occupied a much smaller area, it had a much better chance of survival. At first the division artillery leaders remoted the radios 800 meters from the TOC, but as the exercise progressed we gained confidence in the system and gradually extended the range to 1,200 meters with a final maximum displacement of 1,500 meters.

As we moved the remote site in an arc at its maximum limit, electronically it appeared that the TOC had moved as much as three kilometers. This was an unexpected benefit. The TOC did not have to break down and move as often. Also the TOC could occupy the lower elevations of towns, farms, and built-up areas with the remoted radios on higher ground around the built-up area.

The safety and flexibility resulting from remoting the radios more than compensated for the increased time necessary for the TOC to become operational after displacement. We experienced the predicted set-up time of 45 minutes to one hour. This time was needed to unload the ancillary equipment from the remoted vehicle, check the radios and other equipment, and set up the additional RC-292 antennas.

Remoting is a technique which requires changes in many facets of TOC operations. But it is a good technique if the commander and staff will tolerate its small inconveniences and if proper planning and training go into its execution. From the larger perspective, such inconveniences appear to be a small price to pay for survival.

CPT(P) Thomas E. Hill, SC, received his commission through ROTC at Stetson University in 1973. His assignments have included company command and tours as a Communications Electronics Staff Officer (CESO) with infantry, engineer, and artillery organizations. At the time he wrote this article, CPT Hill was the CESO of the 5th Infantry Division Artillery at Fort Polk, Louisiana.

THE BEAR FACTS:

Someone is watching...

by Captain George T. Norris

Most field artillerymen erroneously believe that the major Soviet threat to their units will come from counterbattery fire. This simply isn't true. The principal threat to American guns will be the Soviet's target acquisition systems; particularly reconnaissance units.

The Soviets consider reconnaissance to be one of the most important of combat support activities. Like everything else in the Soviet system, reconnaissance is very tightly controlled from the top. When considering the vulnerabilities of FA units to detection by Soviet forces, artillerymen must remember that it is an extensive, multi-disciplined reconnaissance effort.

The Soviet commander's reconnaissance operations are closely coordinated with his field artillery's target acquisition effort. Although reconnaissance is in the hands of the Chief of Reconnaissance, his efforts will be tied to those of the Chief of Rocket Troops and Artillery (CRTA). There are several reasons for this. First, to the Soviets, fire support is the most important aspect of combat. Fire support forces create the penetrations that the maneuver forces exploit. To do this the fire support units rely on reconnaissance to identify target areas. Second, the first target priority of Soviet fire support unit is nuclear delivery systems. Such units can be located only by exploiting the full range of the target acquisition and reconnnaissance elements of the ground and air forces.

The first level of the Soviet reconnaissance effort is observation of the battlefield. This is accomplished by all units in contact, the field artillery to include its antitank component, the reconnaissance forces, and anyone else—engineer or NBC unit for example—assigned a reconnaissance task. All fire support forces make their observations more accurate through the use of rangefinders and a variety of angle measuring equipment. The ground reconnaissance forces are specially equipped and organized to be able to carry out their reconnaissance effort deep into the enemy's rear. The operating norms for these reconnaissance forces are 25 and 50 kilometers beyond the Soviet main body for regimental and divisional ground reconnaissance companies, respectively, with those distances doubled in a nuclear environment. In addition to simply observing the battlefield, these reconnaissance forces will conduct raids and ambushes to destroy key units and capture personnel, documents, and equipment for later exploitation. Consequently, any unit operating within 50 kilometers of the forward line of own troops (FLOT) can expect ambushes and attacks. Considering the high priority placed by the Soviets on nuclear delivery systems, field artillery commanders can expect that reconnaissance groups might be given the mission to attack them, specifically. Other forces could be operating in rear areas with the primary mission of determining the disposition and readiness of friendly defenses and units. These troops would be from the divisional engineer battalion and NBC defense organizations. Soviet field artillery units also have the capability to employ special reconnaissance teams in the enemy's rear area. These mobile observation posts would move forward to detect targets out of the visual range

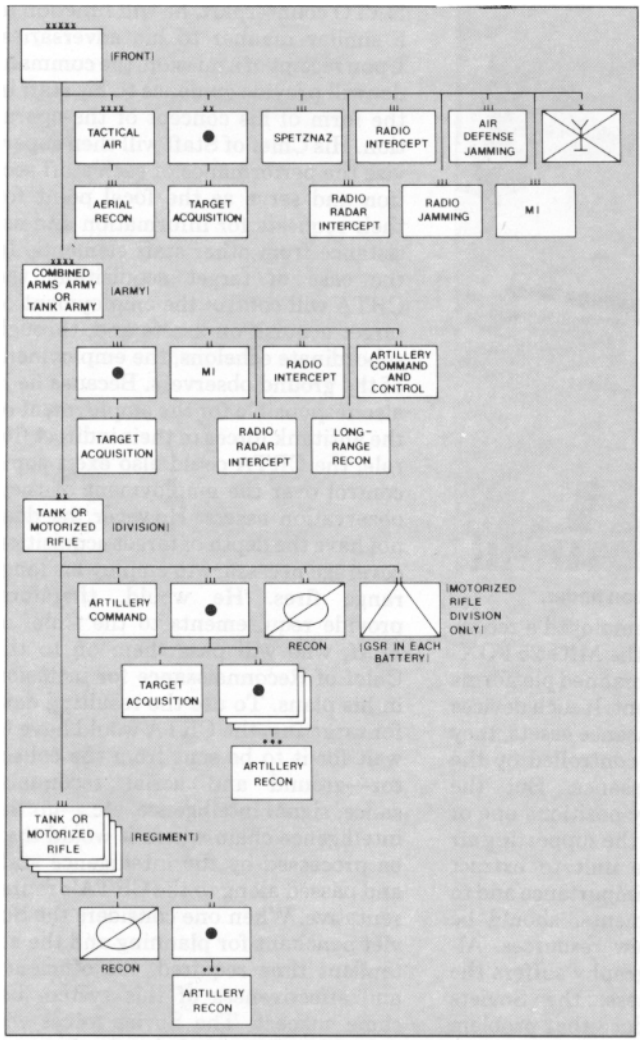
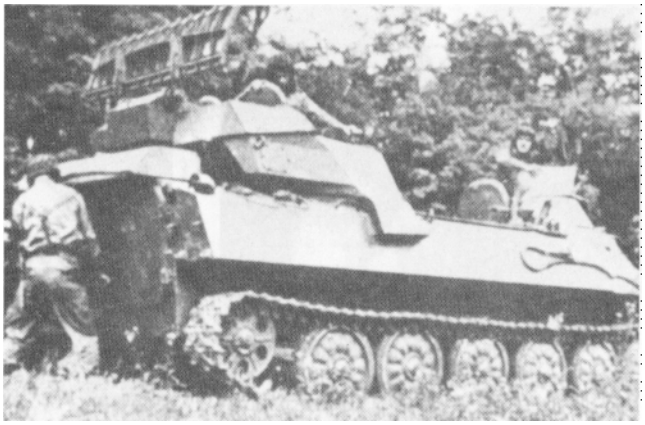
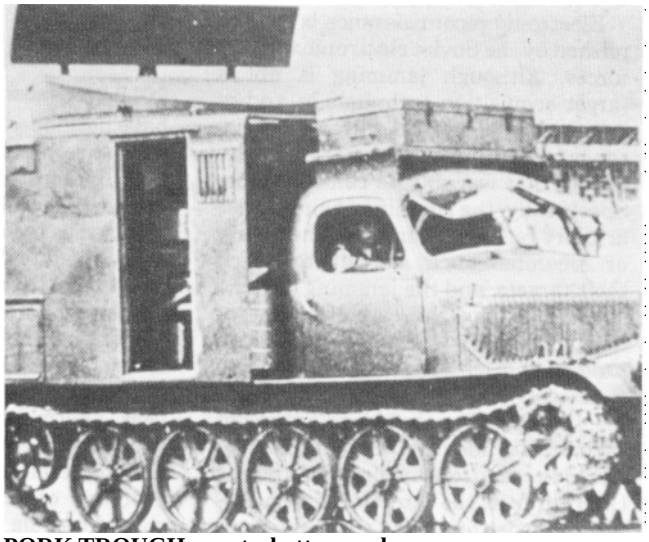


Figure 1. Soviet reconnaissance and target acquisition assets by echelon (using NATO symbology.)



BIG FRED mounted on a modified MTLB armored vehicle.



PORK TROUGH counterbattery radar.

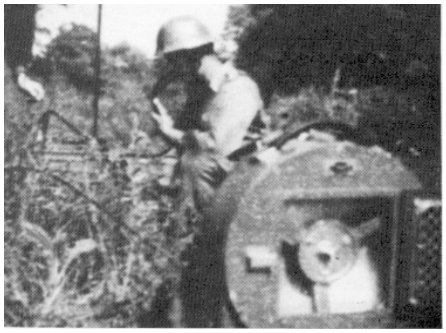
of the battalion and battery command observation posts.

All reconnaissance forces are also equipped with battlefield surveillance radars to enhance their capabilities during periods of reduced visibility. Each reconnaissance company and antitank battery, for example, will be equipped with man-portable battlefield surveillance radars similar to the US AN/PPS-5. These devices allow units to detect moving targets within their zone of operation. Moreover, among its several target acquisition radars the Soviet field artillery employs a mobile battlefield surveillance station known to NATO personnel as SMALL FRED. Mounted on a modified BMP, this system can detect moving targets and might have the capability of being used to adjust artillery fire by detecting the movement of the impacting rounds. Another radar in general use which poses a threat to US artillery units has the NATO code name of BIG FRED. This radar, mounted on a modified MT-LB armored vehicle, gives field artillery a limited counterbattery capability. Today this threat to units is still limited to electronic line-of-sight, although this is extended by the employment of the forces on our side of the FLOT.

To enhance the range of their reconnaissance effort, the Soviets also employ specialized forces and electronic reconnaissance units. Soviet specialized forces include highly trained long-range reconnaissance troops known as SPETZNAZ as well as other forces inserted on special purpose reconnaissance missions. The latter include Soviet airborne and air assault forces as well as Soviet naval infantry. Their range on the battlefield will be limited by the ability of their transporting aircraft or ships to reach the target, and their effectiveness can be degraded by the attack of their transport.

The specialized forces represent a potentially greater threat than the airborne or air assault units because they can be inserted and can operate clandestinely. These forces would come from the army-level long range reconnaissance company and the Front-level SPETZNAZ regiment or brigade. Such forces would probably be inserted prior to the outbreak of hostilities and then operate in civilian clothes or uniforms of NATO forces. In a recent article, Victor Suvorov observes that these forces periodically travel in their future areas of operation in the guise of members of Soviet Army competing teams. Although probably no threat to cannon

Soviet reconnaissance team.

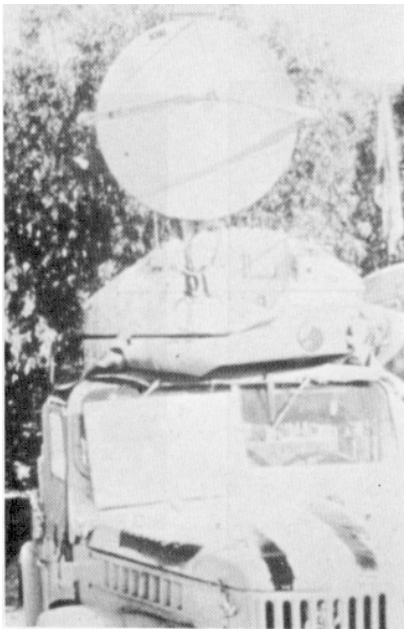


Soviet sound-ranging microphone.

or Lance units, because of their doctrinal depth of employment on the battlefield, SPETZNAZ could represent a serious threat to Pershing and nuclear weapons storage sites as well as to the C^3 network that supports them.

Electronic reconnaissance is accomplished by the Soviet electronic warfare forces. Although jamming is not a target acquisition technique in and of itself, when combined with reconnaissance efforts, it may achieve synergistic effects that warrant its consideration. Specifically, the jamming of air defense artillery radars will enhance the ability of reconnaissance aircraft to reach their targets, and the jamming of radio stations during the establishment of communications invariably results in prolonged discussions regarding which station has a radio that is malfunctioning, making it possible to intercept their traffic, identify the stations, and locate the emitters by direction finding (DF). In fact, the direction-finding effort of Soviet forces is targeted at both communications and noncommunications traffic. Each divisional reconnaissance battalion has the capability to perform radio and radar intercept and direction finding. The artillery target acquisition battery also employs the POLE DISH radar direction finder. These units are further assisted by electronic warfare forces from the army and Front. Their direction finding and jamming capabilities are both ground based and airborne.

The Soviets accept that it is impossible to gather all required information by using only the systems noted above. They have, therefore, given additional resources to an extensive aerial reconnaissance system including visual, photographic, and electronic means. Anyone on the battlefield who flies is expected to be capable of observing the battlefield and reporting information. Because pilot observation is not always effective, the Soviets rely heavily on the use of photography. The aviation forces assigned to the Front have an organic reconnaissance regiment which can provide a wide range of photographic coverage of the battlefield. Although the Soviets use many older, obsolete bombers and fighters in this role, they



POLE DISH radar direction finder.

have developed and employed a reconnaissance version of the MIG-25 FOXBAT. Drones and unmanned platforms are now in development. If such devices are used as reconnaissance assets, they will undoubtedly be controlled by the Chief of Reconnaissance. But the CRTA, who normally positions one of his staff officers with the supporting air force reconnaissance unit to extract photos of immediate importance and to pass photo requirements, should be able to tap these new resources. Although aerial photography suffers the problem of timeliness, the Soviets should be able to reduce that problem significantly with the fielding of a real-time or near-real-time down link to a ground station.

Finally, the Soviets will also employ agents to gather information about their enemy. The espionage effort controlled by the Committee for State Security, the KGB, and the Soviet military intelligence agency, the GRU, will not end in wartime; it will simply take other forms. Their extensive espionage networks, established in peacetime, will be activated. Considering the number of Soviet and Warsaw Pact agents and sympathizers operating in Europe, they will pose a significant threat to units during wartime.

The Soviets will have an impressive array of collectors out on the battlefield. They are not, however, "10 feet tall." Their target acquisition system has some significant problems, particularly in the area of command and control.

Very little information about the Soviet control of its targeting efforts is available; so inferences must be made from the few documents available and from how Soviet proxies perform. Although the Soviet commander has a different staff organization than his NATO counterpart, he will function in a similar manner to his adversaries. Upon receipt of a mission, the commander will provide guidance to his staff in the form of his concept of the operation. His Chief of Staff will then supervise the performance of each staff section and serve as the focal point for their requests for information and assistance from other staff elements. In the case of target acquisition, the CRTA will control the employment of target acquisition assets and, through subordinate echelons, the employment of the ground observers. Because he is also responsible for the employment of the antitank forces in their indirect fire role, the CRTA could also exert some control over the employment of their observation assets. However, he does not have the depth of target acquisition coverage necessary to employ his long-range fires. He would, therefore, provide requirements to the Chief of Staff, who will pass them on to the Chief of Reconnaissance for inclusion in his plans. To use the resulting data for targeting, the CRTA would have to wait for it to be sent from the collector—ground and aerial reconnaissance, signal intelligence, etc.—up the intelligence chain where it would then be processed by the intelligence staff and passed along to the CRTA's representative. When one considers the Soviet penchant for planning and the attendant time required, the efficiency and effectiveness of this system become suspect. The Soviet forces will probably engage in their own thorough form of intelligence preparation of the battlefield. They will focus on preparing elaborate plans at the probable cost of losing sight of the fluid battlefield situation. If NATO leaders are able to make their decisions more quickly than their Soviet counterparts, present the "planning oriented" Soviet staffs with an ever-changing situation, and deny the Soviets critical items of information, they may render the Soviet targeting system ineffective.

But Western artillerymen ought not to be overly optimistic. Although the bear with his target acquisition systems is not "10 feet tall," he remains a formidable opponent whose capabilities need to be recognized and appreciated.

CPT George T. Norris, FA, received his commission through the United States Military Academy. His field artillery assignments include battery commander, warhead detachment commander, and brigade operations and intelligence officer. Currently, he is a Threat/Military Intelligence instructor in the Tactics and Combined Arms Department of the US Army Field Artillery School.

DUMMY DOCTRINE

by Major Thomas S. Grodecki

The numerical disadvantage that we can expect to face in any mid- to high-intensity war precludes us from being content to stand and simply slug it out. We must use every available technique that will enhance our survivability without degrading our capability to perform our primary mission—shooting. The integration of an active unit deception plan and a program of employing semi-autonomous firing positions offers an effective technique that balances survivability and mission.

To date the efforts to counter the threat to our artillery have largely centered on camouflage, hardening, movement, and dispersion. Each of these measures has merit, but individually and collectively they possess inherent weaknesses that make them less than satisfactory. Camouflage makes it harder to find us, but it increases the time required to move. Hardening reduces the effects of enemy artillery, but the required engineer assets will be hard to obtain during any conflict. Although there is little question that frequent moves do enhance unit survivability, the price paid in loss of support is extreme. The prime mission of the artillery is, after all, not moving, but shooting. Dispersion is a vital element of any survival program, but it increases command and control problems.

To survive, the artillery will have to employ elements of all the traditional survivability methods. But to survive and accomplish its mission, the artillery will have to integrate these traditional methods with a detailed scheme of maneuver and an active deception program.

The artillery's use of deception techniques is nothing new. Artillerymen have used them with varying degrees of success for years. During the Falkland War, for example, the Argentines employed dummy howitzers with a great success. They failed, however, to integrate their deception program into an effective fire support program.

To develop a satisfactory deception plan, leaders must use a reverse planning sequence. They must consider which target acquisition assets will most likely be arrayed against their force. The Warsaw Pact can be expected to employ a wide variety of target acquisition assets including aerial reconnaissance, electronic surveillance, sound and flash ranging, and radar. Although each of these systems is effective, each has its limitations upon which artillerymen can capitalize.

An important part of any deception program is the effective use of dummy positions. They are not something that should be installed by higher headquarters employing especially trained experts; rather, they should be a habitual element of every artillery unit's survival program. Leaders should plan the location of the dummy position first; it is the base or anchor around which the battery will position itself.

Although there is sophisticated dummy equipment in the Army's inventory, it seldom appears at battalion and battery levels. This is not a critical problem because adequate dummy equipment can be fabricated locally with little difficulty. Dummy howitzers are not a necessity. All that a dummy position need do is give off the "spoor" of a real unit. Operation security personnel have been preaching for years that standardizing positions identifies what is located there. We can use that pattern to our benefit. For example, camouflage nets set up in a "typical" battery formation, with or without dummy equipment, presents a strong indication that an artillery unit is present. Furthermore, innovative leaders can enhance the believability of any dummy position with a little creativity: They can scatter trash, put up tents, and have vehicles drive through the area to leave tire tracts.

Of all the target acquisition means, enemy radio direction-finding equipment poses the greatest threat to our artillery. Some experts contend that 60 percent of the artillery locations by the Warsaw Pact forces will result from direction-finding equipment. Remoting radios to the dummy position not only effectively neutralizes this threat, but it also dramatically increases the effectiveness of the entire deception plan.

A mid-to high-intensity war will be a very busy affair. Threat forces will have a limited amount of time to spend analyzing and rechecking possible target indicators. If our artillery leaders can send a number of indicators, enemy forces will be compelled to react; and, when they fire on our dummy position, they open themselves to our counterbattery assets.

Because Warsaw Pact doctrine calls for striking approximately a grid square during any counterbattery attack, actual platoon or section firing positions should be located 1,000 to 2,000 meters away from the dummy position. Individual firing elements—be they platoons or sections—should move on command to predetermined positions throughout the area. The effect of this scheme of maneuver is the dispersion of the battery position into semi-autonomous firing sites. The longer a unit remains in an area, the more developed and sophisticated its scheme of maneuver and deception can become.

It would be unrealistic to expect friendly forces to hide the fact that they are using deception measures. However, the very fact that the enemy forces know we are using deception techniques will degrade the reliability of their combat information. Any decision they make to engage our artillery is conceivably fraught with uncertainty and peril. Their photographs, radio traffic analysis, radar, and even sound and flash rays will become suspect.

There are of course limitations to the use of deception. It cannot be undertaken in an impromptu manner. Detailed prior planning is essential as is extensive training of the soldiers involved. A frequent criticism of any deception program is that it takes too much time to implement. Although, time may have been a factor in the massive efforts exercised during World War II, a tactical deception program employed by a well-trained, battery-level unit can be executed rapidly. All today's leaders need to do is think, plan, and practice; deception and survival are achievable goals.

MAJ Thomas S. Grodecki, FA, received his commission from the Field Artillery Officer Candidate School in 1973. His principal artillery assignments have included battalion S2, assistant S3, and S4 as well as battery commander and advisor with a Readiness Group Branch Assistance Team. He has an M.A. in history from Northeastern Illinois University and is a 1984 graduate of USACGSC. Major Grodecki is currently the battalion advisor to the 1st Battalion, 49th Field Artillery (Wyoming Army National Guard).

Survivability for Sophomores:
A Short Course in Staying Alive

by Sergeant First Class Charles C. Sharp

The artillery today, like the rest of the Army, is in the path of an avalanche of technology. Even though the artillery's weapons are not brand new, the tactics and methods for delivering ammunition, acquiring targets, and providing fire direction and communications are changing almost daily. In the middle of this galloping modernization, it is easy to lose sight of the fact that almost everything in the artillery is doing now has been done before, either in our own army or someone else's.

Survivability is a particularly good example of the utility of the past. Staying alive on the battlefield has, after all, been a major concern of the military since the start of organized mayhem. Even the first Assyrian struggling into an iron coat and donning a helmet and a shield recognized that one cannot "Do unto others" unless one can prevent them from "Doing unto you first."

Historians tell us that the United States Army has not paid much attention to survivability over the years because, since the American Civil War, it had never faced an opponent that could match it in firepower. The Indian Wars were largely a match between Indian mobility and army firepower. The Spanish-American War was a mopping-up action from the moment it started. In World War I our primary opponent, Germany, had already been worn down by three years of brutal conflict before we entered the war, and we had two well-equipped allies operating beside us. During World War II, in the Pacific and in Europe, we fought a predominantly light infantry force which in the case of the Germans had already been mauled in Russia. In Vietnam and Korea, we had reprises against light infantry forces—our firepower against their mobility. While our infantry, armor, or cavalry had on occasion faced an enemy on even terms, such as in the Ardennes in 1944, the artillery had not. For over 100 years, incoming counterbattery fire had been relatively rare.

The second reason for our lack of appreciation of survivability practices has only been apparent in the past three conflicts. Except for a brief period in 1942, the US Army had never fought without air superiority and had not experienced the damage that airpower could do to a fire support system.

Today, we face a probable opponent with as much or more firepower than we have. In a European theater operation, NATO air superiority may initially be, at best, local and fleeting. And it may well belong to the enemy throughout a goodly part of the battle. To understand the effect of these conditions—to glean some survivability lessons form history—we have to study those forces that have fought under conditions where survivability was at issue. As it happens, those forces include our probable opponents and their, and our, previous adversaries: the Soviet and German forces of World War II.

For most of the first 18 months after the Germans attacked the Soviet Union on 22 June 1941, the Soviet Army fought under conditions of enemy air superiority and enemy firepower superiority. They learned many of their lessons the hard way. An entire rifle (infantry) division lost all its artillery and heavy weapons on a three-day road march when enemy aircraft attacked heavy equipment on a forest road. There was no way to get off the road and disperse, and the rest of the column was disrupted by the resulting blockage. As a rule the Soviets found that units which were not camouflaged were spotted and taken under fire. When the units moved to avoid counterfire, they were easily spotted and destroyed by airpower. By 1943, Soviet units moved either at night or under an umbrella of air defense forces. Traffic control had to be rigorous to keep the exposure of units through movement to a minimum—especially through chokepoints, such as bridges or crossroads.

Soviet camouflage and deception became sources of lessons to the German opponents. The Germans discovered that the Soviets were capable of hitting them with massive fires and that not being seen might be their only defense. All Soviet units built at least one or more sets of dummy positions. An unoccupied position was indistinguishable from an occupied position—even to having a few troops in the dummy position to provide noise and movement

Wrecked German equipment outside Stalingrad.

155-mm howitzer blasts German lines north of Periers-St.Lo highway.

or light fires to provide smoke or infrared signatures. Both sides learned that predictability could get you killed.

As the tide of the war turned against them from late 1942 on, the Germans started putting into practice many of the Soviet tactics and added some of their own. Not only did they put into effect rigorous camouflage discipline, but added some more technical survivability techniques. Where the terrain precluded frequent movement to avoid counterfire, explosive charges were set off one or two miles in front of battery positions to give false sound and flash signatures to enemy targeting units. The same target acquisition elements could also be overloaded by firing a single mission from several different batteries at once, rather than multiple rounds from one battery or firing simultaneous missions from different calibers or types of weapons. The Germans also made use of roving single guns to divert enemy targeting assets from battery positions.

In protecting against enemy air superiority, the German Wehrmacht in the latter part of the Second World War probably gained more experience than any other army in history. The primary lesson they learned was that movement attracts aircraft. Consequently, their corollary became to never move in daylight or in the open where aircraft were likely to spot them. Units moved in short bounds from cover to cover, with camouflaged positions ready as soon as they stopped moving. They learned that every move must be carefully controlled and planned because anyone caught in a traffic jam was as good as dead.

Lessons from 40 years ago may not seem applicable today with the rapidly changing technology, but the survivability lessons noted above are appropriate. The lessons can be summed up simply:

- ***Camouflage.*** Camouflage is a French word, and it was ironically first used in its modern sense by French artillerymen at Verdun in 1916. Their aim was to avoid counterfire. When every attempt to move may bring enemy air craft down on us, doesn't it make sense not to have to move as much?
- ***Predictability.*** It kills. A corps artillery commander in USAREUR once commented that he could always find an American artillery unit because they would always be "in the woods for camouflage and on the crest for good (radio) communication. . . ." If it is that easy to predict where our units will be, all the camouflage and movement in the world will not keep us alive.
- ***Planning.*** In the face of combined counterfire and air threats, "winging it" is not good enough. Movement has to be carefully planned, prepared, and controlled if the moving unit is to arrive without serious losses. Active camouflage and deception practices will not work unless they are coordinated and planned to be consistent, realistic, and truly deceptive.

The United States Army has fought its wars in relative luxury: the luxury of air support and firepower superiority. Our maneuver units have gotten used to having fire support more available than the enemy's fire support, and all of us have gotten used to *not* having to worry about our survivability on the battlefield. That luxury could be far too expensive in the future.

In the first five months after the Soviet Union was attacked, they suffered losses of over one and a half million men killed, their entire pre-war tank force destroyed, and over 60,000 mortars and artillery pieces destroyed or captured. Survivability lessons on the battlefield come high. It makes a lot more sense to learn from someone else's successes and failures; especially when they have already paid for them.

SFC Charles C. Sharp has served in a wide variety of troop and staff positions including tours as chief computer, liaison sergeant, and operations and intelligence sergeant in Europe and the United States. He has a B.A. in history from Pennsylvania State University and has completed the Field Artillery Officer's Basic Course by correspondence. He has published articles in *Strategy and Tactics*, *Campaigns*, and *Slingshot*. Sergeant First Class Sharp is currently a senior instructor in Lance and MLRS fire direction at the US Field Artillery School.

View from the Blockhouse

FROM THE SCHOOL

Journal Notes

Fond farewell

Over the years women have made a lasting contribution to the Field Artillery. Everyone has heard of the courageous exploits of Molly Pitcher and the superb service of the Branch's uniformed ladies, but few have recognized a hidden population of women who have, perhaps, made a far more profound impact on the evolution of the "King of Battle." These are the dedicated women of the Civil Service.

One member of this important group warrants special recognition as she leaves the fold and the branch she has supported for so long. Mrs. Mary Corrales, the Managing Editor of the *Field Artillery Journal*, is retiring after 34 years of service to our nation and its Armed Forces. During her career Mrs. Corrales has supervised the creation of thousands of documents and designed hundreds of captivating and effective publications. But nowhere has the breadth of her knowledge and the fullness of her creativity been more evident than in the 56 issues of the *Field Artillery Journal* that she has composed. She has been the guiding hand, the innovative force, and the wise advisor. Under her leadership the *Journal* has grappled with the impact of unprecedented change in the Field Artillery and has consistently provided the information that a quarter of million readers need.

As she departs Mrs. Corrales leaves spaces that will be difficult if not impossible to fill. Her colleagues will miss her cheerful demeanor, her unparalleled talents, and her persistent championship of Oriental cuisine. Authors will miss her sage advice and her courteous manner. But more significantly the Field Artillery will miss a gallant lady who has done so much in service to the "King of Battle." To Mrs. Corrales—Thank you and God speed; we all will miss you.—Ed

Updating doctrine

Doctrinal development and dissemination is a dynamic business. Thus, the scheduled publication dates of doctrinal literature are often delayed to incorporate changes resulting from comments of the testers and users of doctrine—soldiers in the field.

The Field Artillery School gathers three specific pieces of information regarding coordinating drafts sent to field: how many draft manuals were staffed, how many units responded, and the quantity and quality of comments received. During September and October two manuals were passed to the field:

- Coordinating draft of Change 1 to FM 6-50, *Field Artillery Cannon Battery*—Addresses doctrine and procedures for the battery in offensive and defensive situations; 355 copies were staffed, and USAFAS received 10 replies. Personnel in the field provided 10 comments, which will be incorporated into the final draft of the field manual.
- Coordinating draft of FM 6-30, *Field Artillery* Observer—Describes observed fire procedures for the fire support team (FIST) and other observers; 1,096 copies were staffed, and USAFAS received 23 replies. Personnel from the field provided 172 comments of which 67 have been incorporated to date.

In summary, the Field Artillery Community's responsiveness to the draft "how to fight" manuals has been poor. The quality of doctrinal literature improves with each comment received in that it is developed to meet the needs of the field artillerymen in the field.

Upcoming field manuals that will be mailed to the field for comment are:

- The outline of Change 1 to FM 6-20-1, *Field Artillery Battalion*—Describes how cannon battalions fight, are organized, and operate as part of the combined arms team.
- The outline for FM 6-40-1, *Field Artillery Cannon Gunnery (Automated)*—Provides procedures encompassing all aspects of automated gunnery employed by cannon units during training and combat.
- The outline for FM 6-2, *Field Artillery Survey*—Provides a guide for commanders, survey officers, and personnel engaged in the conduct of field artillery survey.
- FM 6-40-4, *Field Artillery Lance Missile Gunnery*—Provides a guide for solution of the Lance gunnery problem.
- Change 1 to FM 6-161, *Field Artillery Radars*—Provides a guide regarding the employment of field artillery radars.
- FM 6-12, *Coordinating Draft* (formerly FM 6-999J) *Pershing EE Battalion and Brigade Operations*—Describes the organization and operation of the Pershing II Battalion and Brigade.

Field circulars to be printed in January or February include:

- FC 6-42-3, *Lance Missile Organizational Concept*—Provides a guide for maintenance supervisors in a Lance battalion.
- FC 6-42-10, *Lance Preventive Maintenance Indicators*—Supplements DA Pam 750-1.
- FC 6-40-40, *Lance Missile Extended Range Gunnery Procedure*—Outlines gunnery procedures for a TI-59 calculator solution to the extended range gunnery problem for the Lance missile.

Doctrine Division action officers will welcome suggestions from the field. Contact them at AUTOVON 639-4225/6063 or write to:

Commandant
US Army Field Artillery School
ATTN: ATSF-DD
Fort Sill, OK 73503-5600

Survivability doctrine

At the 1984 Fire Support Conference, the Tactics and Combined Arms Department (TCAD) of the Field Artillery School, distributed a preliminary draft of a field circular (FC) on survivability. The FC emphasizes "how to think," rather than "what to do." TCAD leaders believe that existing publications—FMs 6-50, 6-20, and 6-20-1—adequately cover survivability techniques. What is needed, they conclude, is a codification of survivability principles: the general rules which collectively establish a "way of thinking." These principles should guide artillery tacticians in every theater as they address the particular tactical problems facing them.

The draft circular emphasizes the importance of the estimate of the situation as a tool for commanders and staff officers. The estimating process provides an efficient and effective approach to analyzing threats to artillery survivability; identifying appropriate survivability techniques; and deciding what specific tactics, techniques, and procedures to employ.

TCAD welcomes your comments. Contact MAJ Christopher Cortez at AUTOVON 639-3497, or write: US Field Artillery School, ATTN: ATSF-TA, Fort Sill, OK 73503-5600.

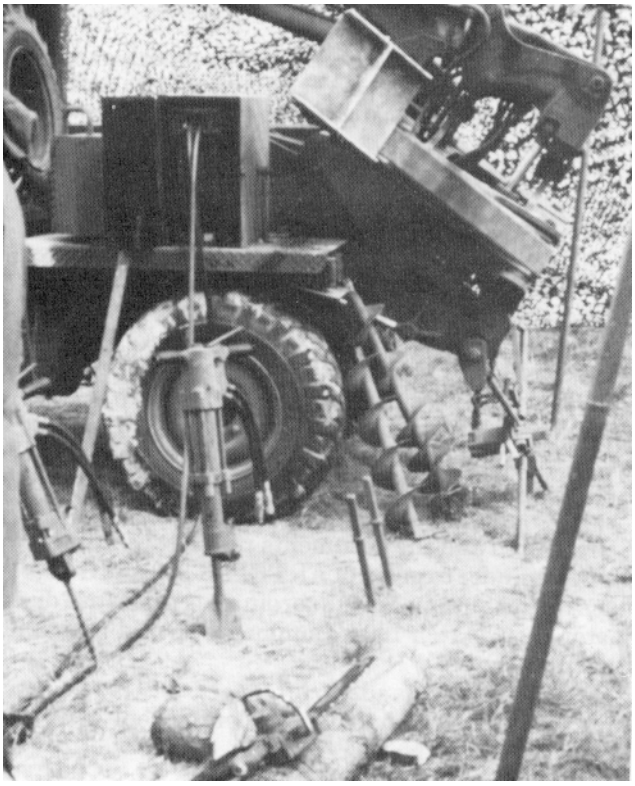
BATTLEKING projects

The BATTLEKING Program of the Field Artillery Board has considered a wide variety of suggestions from the field regarding enhancement of unit survivability. Two particularly noteworthy submissions and their dispositions are described below.

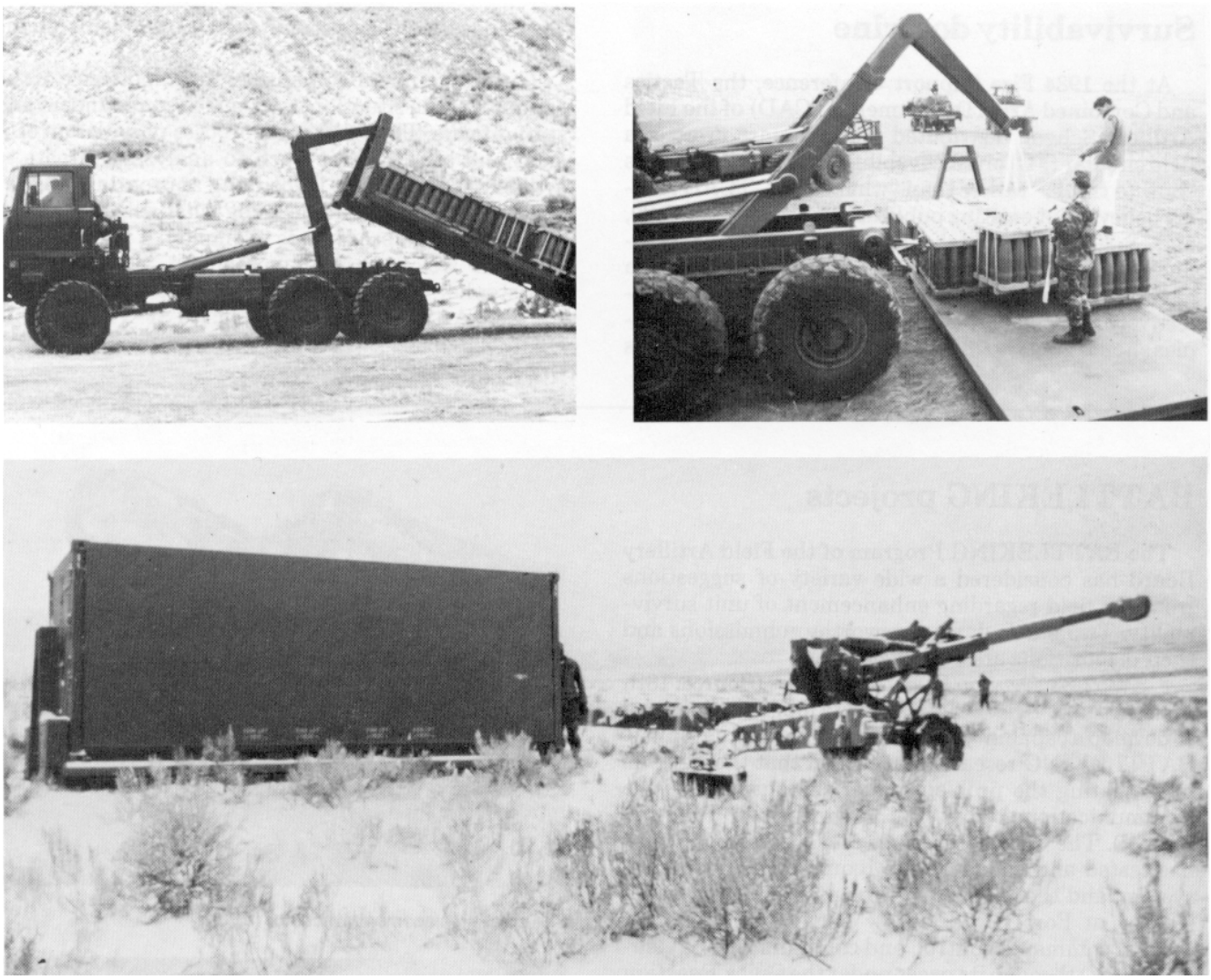
● SW52-83, *Develop Remote Antennas* (Source: 18th Field Artillery Brigade)—There is a longstanding need to develop a capability to remote FM and HF antennas. BATTLEKING researchers learned that the Army is investigating the problem under the auspices of the Communications System Engineering Program (CSEP). The Communications and Electronics Board has tested and validated the requirement for such a system, and the Army Deployment and Employment Agency at Fort Lewis is now putting the resulting tactical command, control, and communications vehicle (TC3V) through its paces under the Quick Reaction Program (QRP). This developmental approach should place such equipment in the field in three to four years. The TC3V system incorporates a low wattage command post radio which transmits its signals up to three to eight kilometers to the TC3V which carries antennas and radio-like devices capable of retransmitting FM, HF, and TACSAT signals on the move. ADEA action officers indicate that the likely basis of issue for the system will be 25 to the motorized division and 14 to the light and heavy divisions.

● BK38-84, *Excavation Vehicle for the Field Artillery* (Source: 2d Battalion, 12th Field Artillery)—Field artillery units may have to harden their positions in order to survive. To accomplish that task they need an organic earth moving capability. The BATTLEKING investigators learned that the Army has developed a requirement for a vehicle that may fill the need—the small emplacement evacuator (SEE). Developed by the Engineer School, the SEE consists of a backhoe, a front-end scooploader, and a hydraulic power take-off mounted on a mobile chassis. The 9th Infantry Division (Motorized) is currently evaluating a surrogate vehicle and has authorized a SEE in each cannon and service battery in the Division Artillery. At present there is no established field requirement for the SEE outside the motorized division.

The small emplacement evacuator (SEE).



Photos by MAJ Don Nimblett



Photos by LTC Bob Zawilski

The additional load-carrying capacity of the Palletized Load System (PLS) vehicle (to be featured in a later *Journal*) permits additional crew survivability measures. One concept "recycles" MILVANs (20-foot logistic shipping containers) into crew shelters. This can be enhanced with lightweight armor that covers the MILVAN and extends overhead from the rear of the MILVAN to the breech of the howitzer.

Draft ARTEPs

The coordinating draft editions of ARTEP 6-100, *Field Artillery Cannon Battery;* 6-400, *Field Artillery Cannon Battalion;* and 6-625, *Pershing II,* are now being distributed to the field for comment. In ARTEPs 6-100 and 6-400, chapter 3 has been written in detailed training and evaluation outline (DTEO) format. A battery test and instructions on the conduct and scoring of the test have also been added. All reviewers are encouraged to submit comments. Timely submissions will be considered and the documents revised accordingly.

A reminder to users of ARTEPs 6-300 and 6-300-1 is that comments on those coordinating drafts are due no later than March 1985. Comments should be submitted to:

Commandant
US Army Field Artillery School
ATTN: ATSF-DUA
Fort Sill, OK 73503-5600

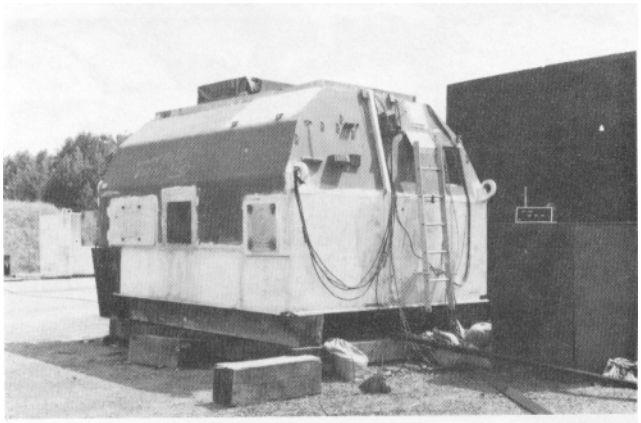
Correction

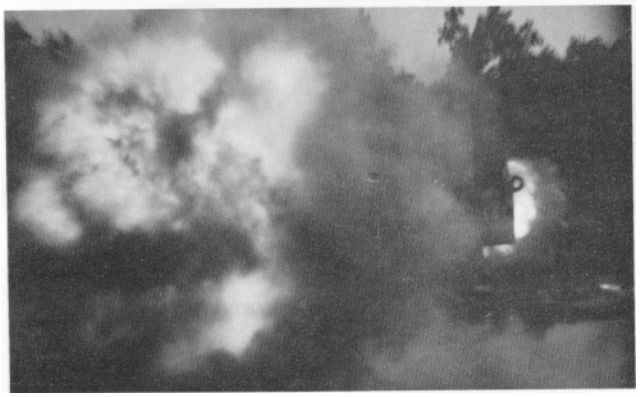
Captain Daniel J. Travers, co-author of "Stahl am Ziel" in the November-December 1984 *Field Artillery Journal,* pointed out some errors in equipment nomenclature that need correcting:

- On page 14, column 2, last paragraph, third line, should read *AN/GRC-122* instead of AN/GRC-12.
- On page 15, first paragraph, third line, should read *KWK-7* instead of KW-72.
- On page 15, second paragraph, 13th line, should read *1077* instead of 1097.

Fragments

FROM COMRADES IN ARMS





Fire extinguisher for FAASV

The US Army Test and Evaluation Command is testing an automatic fire extinguisher system (AFES) for the Army's M992 field artillery ammunition support vehicle (FAASV). The aluminum-armored FAASV is designed to carry up to 93 rounds of 155-munition to support the M109 self-propelled howitzer. If the FAASV is hit by an enemy projectile that ignites flammable fluids in the vehicle, test engineers want to ensure that the AFES extinguishes the fire in less than 250 milliseconds and that it does not needlessly discharge its fire extinguishing agent. The AFES has four cylinders which contain Halon 1301 (bromotrifluoromethane). If the contents of the first two cylinders do not extinguish the fire, the second pair of cylinders are activated.

The Army has signed contracts to purchase 174 FAASVs which should reach artillery units in Europe by mid-1985. In addition to fire protection, the FAASV gives its crewmen protection from small arms fire, shrapnel, and nuclear, chemical, and biological weapons. The FAASV also provides artillery batteries with an ammunition supply vehicle that has the speed and mobility to keep pace with the M109 howitzer.

A variation of the FAASV, the XM1050, is undergoing test and evaluation to serve M110 8-inch howitzer units. The XM1050 will carry 48 rounds of 8-inch ammunition.

Diesel generator sets

Two contracts have been awarded for three each 15-, 30- and 60-kilowatt signal-suppressed, diesel-engine-driven (SSDED) generator sets. The sets will be tested at Fort Belvoir, Virginia.

Existing sets can be easily located by the enemy because of the uniqueness of their acoustic and thermal infrared signatures. The functions of a combat system, its echelon of deployment, and its level of importance on the battlefield may also be determined through analysis of signature emissions. SSDED generator sets will have suppressed acoustic and thermal infrared signatures and be nuclear hardened. Electrical power quality equivalent to present Department of Defense standard generator sets and increased reliability are required.

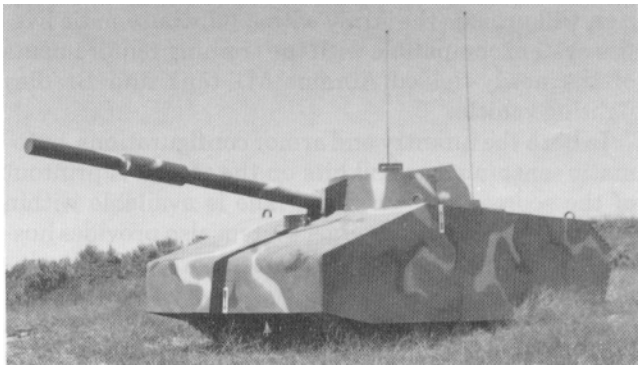
If the SSDED generator sets prove to be suitable and cost-effective, they will be type-classified and will replace current generator sets in the acquisition cycle.

Armored target vehicle

A full-sized armored moving target vehicle that can be operated by two crew members and withstand direct hits from .50-caliber ball ammunition is undergoing extensive field testing.

The hybrid vehicle, which sports a Soviet-look-a-like shell atop a US M551 Sheridan combat vehicle chassis, is built to almost exactly the same scale as the Soviet T62 tank. The armor-plated shell is attached to the chassis with four large mounting pins—two in the front and two in the back. Approximately two and a halftons of additional weight were added to the normal combat loaded weight of the M551 in this conversion to a target vehicle.

The interior of the target tank has a nylon ballistic lining that muffles noise and reduces flying fragments if penetration of the outer shell occurs. The target vehicle is equipped with escape hatches; two radios; a hit detector, which alerts the crew when they have been hit; an automatic fire detection and extinguishing system; and a submarine-type periscope.



Armored target vehicle.

The target system in action for infantry training. (Sperry Corporation Photo)

Remoted target system

The Army recently awarded the Sperry Corporation a $25.7 million contract to produce a remoted target system (RETS) which uses moving targets for armor and infantry live-fire exercises.

The ranges will be configured for either infantry or armor training, depending on the needs of a particular Army installation. Range training officers can program the system to simulate many combat scenarios through a central computer control console.

The infantry targets are three-dimensional and are made of high-density polyethylene, which can withstand up to 2,000 hits before replacement. The targets move at variable speeds up to eight miles per hour.

The armor moving target carrier is capable of moving a full-scale, two-dimensional plywood tank target at speeds up to 25 miles per hour. The remoted target system, combined with the armor moving target carrier, will provide the Army with a fully automatic live-fire system compatible with the training requirements of the newly-fielded Abrams M1 tank and Bradley fighting vehicle.

In both the infantry and armor configurations, automatic sensors record all hits on the target. A printout of the scores for each firing lane is available within minutes. The remoted target system also provides hostile fire and muzzle flash simulation during night training exercises.

The Sperry Corporation has also developed a portable version of the fixed range which uses a radio controller and stationary and moving targets. A number of portable systems have already been delivered to US Army units and to the Egyptian government.

Spall liners improve survivability

As more and more lethal anti-vehicle ordnance is developed, Army combat vehicles demand a proportionally increased level of survivability to counter these threats. The spall liner system provides this survivability with an interior lining behind the vehicle's conventional armor on the sides and roof.

Spall liners not only protect the crew members from direct hits but also provide crew protection against stowage fires and secondary projectiles hurled about the crew compartment.

Logically an effective spall liner material would be similar to the material used in seat backs on advanced aircraft. However, to be sure, candidate materials have been tested on an armored vehicle subjected to high-explosive and kinetic energy attacks. The results of such tests including attacks by TOW (HEAT) bomblets, 30-mm GAU-8 rounds, 14.5-mm API rounds, .30-caliber AP rounds, and 20-mm FSP rounds showed that a semi-rigid panel of laminated Kevlar 29, spaced approximately 16 inches from the side armor of an M113 armored personnel carrier, met system requirements for direct-hit crew survivability. A similar panel could be bolted and cemented directly under the roof of the vehicle to protect against an artillery threat. The potential of spall liners as a survivability enhancement to new systems appears to warrant continued study and consideration by developers of all mobile weapon systems. (Kathy G. Janoff, FMC)

Commander's cupola and secondary armament of the International Turret. (Emerson Electric Company photo)

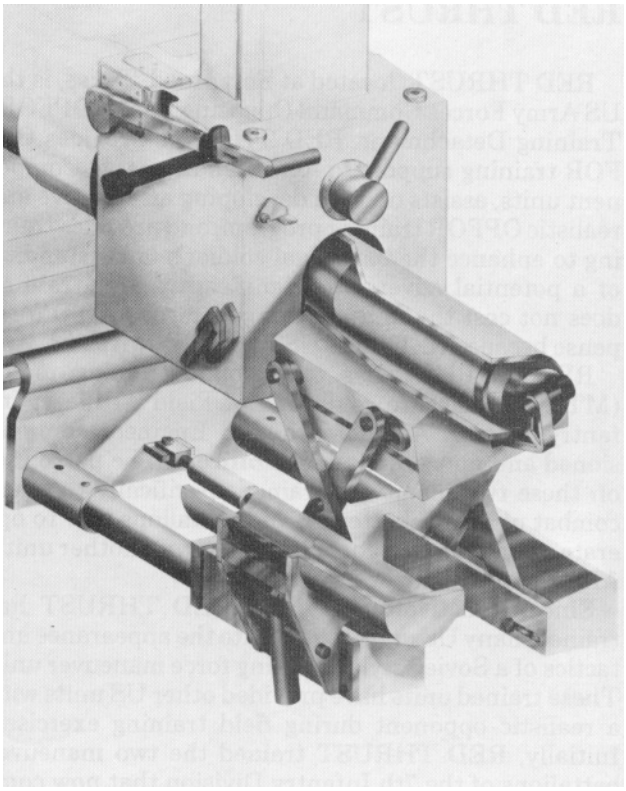
International turret

A well-emplaced, tactically situated firing unit is an essential component of a mobile ground force; however, to remain effective, it must survive. Survival is achieved by defeating the threat, avoiding acquisition and attack, and minimizing vulnerability. According to BMY engineers the International Turret, designed for rapid installation on the M109 chassis, provides the field artillery with a possible quantum jump in these capabilities.

The International Turret is armed with a 155-mm cannon capable of delivering all modern ammunition. The system's range of almost 40 kilometers not only allows delivery of effective counterbattery fire deep into enemy territory but also makes maneuver by fire a realizable tactic. The turret is fitted with a semiautomatic loader which is capable of supporting a rate of fire of eight rounds per minute and a burst rate of three rounds in 15 seconds.

To avoid acquisition and attack, the International Turret features a fully integrated C^3 system including a position location and gun pointing system and, if desired, a full-solution technical fire control computer.

To minimize vulnerability, Kevlar laminates are used to enhance crew protection from fragmentation. In addition, a full-width propellant storage bustle creates a crew-safe environment in case on-board powder stores are ignited by enemy attack. The bustle stores 36 propelling charges in individual storage tubes. Should the enemy ignite one or more charges, the explosive force will be vented away from the crew compartment. This unique design of the storage tubes also deters the ignition of neighboring propellant charges.



Ammunition loading system for the International Turret. (Emerson Electric Company photo)

The long gun tube, self-obturating breech mechanism with automatic primer feed is ballistically similar to the tubes used on the M109, M198, and FH/SP70 howitzers. The full range of standardized 155-mm ammunition including illumination, smoke, high-explosive, and bomblet rounds maybe used.

A new bulldozer blade kit is being tested for the M1 Abrams tank. It is mounted on the lifting eyes and towing lugs of the tank and is powered by the tank's electrical system. The new kit would use moldboard geometry to improve driver vision and system performance and to take advantage of the lower profile of the M1 tank. The blade would be capable of clearing debris and rubble, as well as improving defensive fighting positions and breaching obstacles.

RED THRUST

RED THRUST, located at Fort Hood, Texas, is the US Army Forces Command Opposing Force (OPFOR) Training Detachment. RED THRUST provides OPFOR training support to Active and Reserve Component units, assists units in developing an effective and realistic OPFOR training program, and provides training to enhance the individual soldier's understanding of a potential adversary. Significantly, this training does not cost the unit anything in terms of TDY expense because RED THRUST pays its own costs.

RED THRUST has two mobile training teams (MTTs), which are composed of Field Artillery, Infantry, Armor, Air Defense, and Engineer commissioned and noncommissioned officers. The personnel on these two teams are trained specifically to teach combat platoons, batteries, and battalions how to operate as an opposing force in support of another unit's ARTEP or maneuver training.

Since its activation in 1977, RED THRUST has trained many US units to replicate the appearance and tactics of a Soviet-style opposing force maneuver unit. These trained units have provided other US units with a realistic opponent during field training exercises. Initially, RED THRUST trained the two maneuver battalions of the 7th Infantry Division that now comprise the highly proficient OPFOR 32d Guards Motorized Rifle Regiment at the Fort Irwin National Training Center. Other units trained by the detachment include companies, battalions, and squadrons of the 1st Infantry Division, 1st Cavalry Division, 2d Armored Division, 4th Infantry Division, 197th Infantry Brigade, 3d Armored Cavalry Regiment, Armor School, Arkansas National Guard's 39th Infantry Brigade, and Pennsylvania National Guard's 28th Infantry Division.

The detachment also has a series of 14 unclassified classes, complete with script and 35-mm slides, which can be borrowed by units up to 30 days. These 14 classes on Soviet operations are:

- Offensive tactics.
- Defensive tactics.
- Air defense.
- Airborne threat.
- Organization and equipment.
- Airpower.
- Threat to the NATO rear areas.
- Naval threat.
- Naval infantry.
- NBC warfare.
- River crossing operations.
- Artillery operations.
- Northern operations and capabilities.
- Behind the Soviet war machine.

Many units have used these classes to satisfy threat training objectives and to provide knowledge and visibility to junior leaders who are selected to present the instruction within the unit.

Other training support services provided by the detachment include a quarterly newsletter, the *RED THRUST Star;* an information packet of OPFOR reference material; and a slide duplication service from a library of over 7,200 35-mm slides covering Soviet topics and equipment. These services are available to CONUS units upon request. The detachment also assists units with battle scenarios and provides answers to specific questions. Units wishing assistance should call AUTOVON 737-1725/4171 or write to:

Commander
US Army FORSCOM OPFOR Training
Detachment (RED THRUST)
P.O. Box 5068
Fort Hood, TX 76544-0056

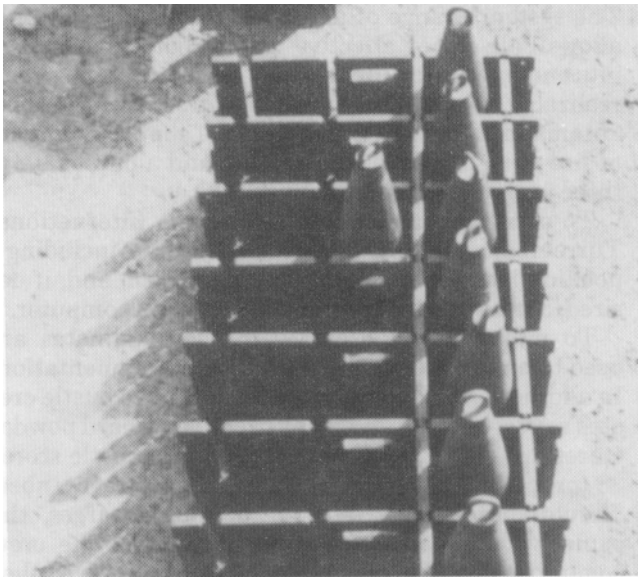
Egg crates

The "egg crates" discussed here are not for eggs; rather, they are used to transport rounds of ammunition that have already been unpacked from their rigid wooden pallets. "Egg crates" are interlocking sections of sturdy plastic that can be pieced together in the back of a truck to secure ammunition rounds—fuzed or unfuzed—so that they can be transported safely and be readily available for firing.

Not only are these ammunition racks low in cost and simple in design, but they solve a pressing problem: securing ammunition during movements. The weight and shape of projectiles normally prevents their being stacked tightly enough to fill a truck bed and makes it difficult to secure them. In a moving truck, the loose shells fall over on their sides and roll and bounce around. Such treatment can damage the shells and can affect the accuracy of the round when it is fired.

The plastic sections of the "egg crate" ammunition racks are interlocked, a panel at a time, as the individual round is slid into each slot. Normally two trucks are required to deliver both the shells and the necessary propellant charges to a given point, but the cans of propellant charges can be stacked on top of the assembled racks and be carried along with the projectiles.

The racks will be sent to several units for evaluation before the "egg crates" are fielded.



In this partially loaded unit, longitudinal pieces have been added after the initial row is filled with projectiles.

The small unit support vehicle shown here belongs to the 1st Battalion, 37th Field Artillery, and is pulling a 105-mm howitzer, the unit's primary weapon system.

Small unit support vehicle

FORT RICHARDSON, AK—The Army recently purchased 257 small unit support vehicles (SUSVs.) for use by Active and National Guard units in Alaska.

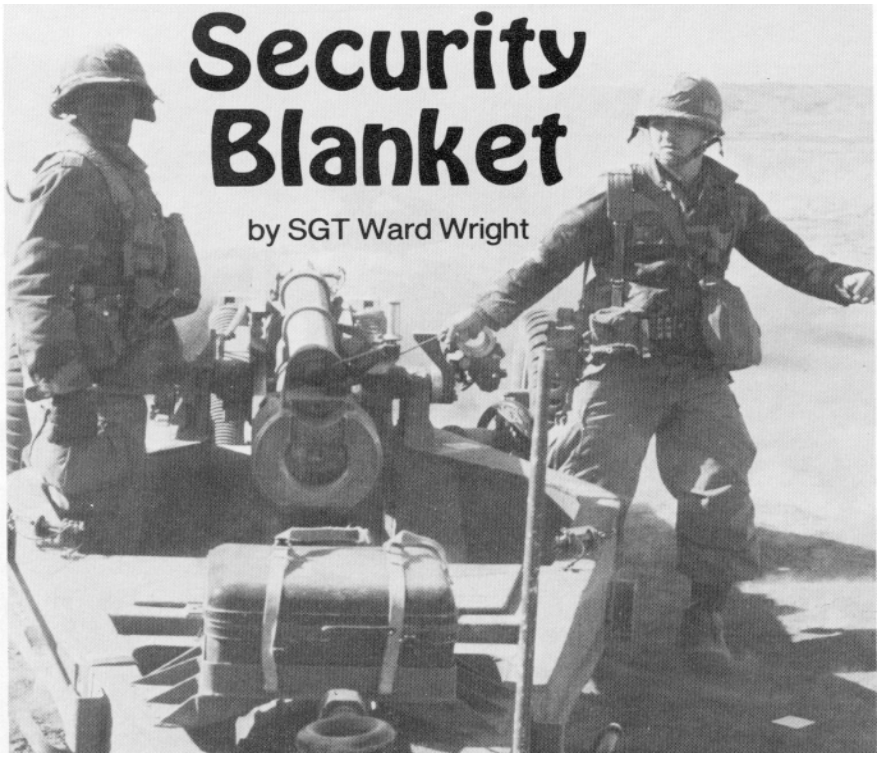
The small unit support vehicle is a lightweight (9,790 pounds) track-laying conveyance which is designed for platoon-sized units in northern and mountainous regions. The vehicle can be used to carry selected items of equipment, ammunition, and supplies. It can transport 17 fully-equipped soldiers or 4,190 pounds of supplies plus the driver. Or it can be used to evacuate injured personnel, tow one or two 10-man ski patrols, or pull light weapons such as 105-mm howitzers.

Each SUSV is composed of two fiber-glass plastic reinforced bodies mounted atop track-driven sections that are joined by an articulated steering unit. Each of the two tracks on both sections is power-driven. The SUSV can travel 25 miles per hour up to a range of 200 miles depending on the terrain. It can negotiate 31-degree hard-surfaced grades, 17-degree grades in deep snow, and when traveling across the side of a slope can traverse grades of about 40 degrees. It is powered by a four-stroke, in-line, 5-cylinder diesel engine, which has an average fuel consumption rate of four miles per gallon. The vehicle measures 22 1/2 feet long; 6 feet, 1 inch wide; and 7 feet, 9 inches high. Tests on the first two SUSVs at Fort Greely, Alaska, showed that the vehicle can start and operate at temperatures as low as minus 50 degrees Fahrenheit.

The first of a new generation of OH-58 Kiowa helicopters arrives at Yuma Proving Ground for Army helicopter Improvement Program (AHIP) testing. Designs and specifications drawn up by the Army Aviation Systems Command require a modification to the underpowered OH-58A that will result in a low cost, high technology scout helicopter. The improved helicopter will be a faster, longer-range, and more versatile aircraft which can be further modified to accept air-to-air or air-to-ground missiles.

Security Blanket

by SGT Ward Wright



If towed field artillery is to play a viable role in tomorrow's AirLand Battle or any other kind of battle, cannon crewmen have to have some kind of individual protection from overhead and ground-burst artillery fire as well as from air attack—and we have to have it now!

Tomorrow's battle against a superpower and its surrogates will find the field artillery in a whole new ball game. For one thing the battles, on the average, will be fought with heavier caliber weapons, and both sides will have improved munitions. Extensive use of proximity fuzes and counterbattery radar will undoubtedly exact swift retribution on units which linger too long in exposed positions. And allied air superiority will probably be lost for varying lengths of time—a condition relatively foreign to past American military experiences. Also, our side may well be outgunned and outnumbered. Consideration of the increased lethality of the battlefield and the sheer difficulties in transporting a trained artillery replacement from the States to a unit operating perhaps behind enemy forward elements in a battle of fluid lines makes crew survival a matter of utmost importance.

Under the pressure of enemy fire or air attack, gun crews who want to live to fight another day will simply go to the ground.

These are not cheerful prospects for either self-propelled or towed field artillery crews. However, it is with survival of the latter that I am largely concerned.

In the past, protection for individuals under fire usually centered around entrenchment—digging in—as the best hope of survival. And, indeed, digging in is the *best* hope provided there is time to do it properly.

Various Army manuals contain plenty of explicit drawings of protective entrenchments showing shoulder-depth holes with log and sod roofs, firing steps, grenade sumps, and the like. But what relevance do they have for the hard-working towed section which must move two, three, or even more times a day?

As a youth serving in the 1st Marine Division in 1954, I built several of these covered positions along the main line of resistance in Korea, and I can tell you that the labor required to entrench takes days rather than hours to complete, especially when soldiers have a mission to carry out and cannot devote the entire day to digging. It takes a lot of axe and shovel work for each crewman to dig even a prone excavation with truly effective overhead fire cover—and, in addition, there had better be plenty of trees and pioneer tools available.

In 1984, my National Guard unit held its annual training during the first two weeks of June in blistering heat at Fort Indiantown Gap, Pennsylvania. My section made two or three moves a day. For some reason Range Control wisely—I say wisely because of the lessons we learned and the realistic training we got—for the first time allowed us to dig holes in their firing points and to cut as much live camouflage as needed for concealment both in battery and on the march.

Upon pulling into position, our instructions were to set up guns and ammo shelters, carry out the mission as ordered, and dig a machinegun emplacement with overhead shelter and such other individual protective positions as time permitted.

It's hard to get an American to dig even to save his own life, and we far prefer the backhoe to the pick and shovel; but our battery did give digging-in an honest try. Now I am 50 years old, but I am strong and have a good attitude towards digging. Indeed, I find it mildly therapeutic, much as some men enjoy splitting firewood. Luckily, our section members had been forewarned of the coming emphasis on hole-digging. They had purchased extra long-handled shovels at their own expense and "promoted" some extra pick-mattocks from post maintenance.

Day after day in heat which mocked our every past sin; and, in between two or three moves a day, not to mention other gun-related chores, our section started digging regulation-style machinegun positions and attempted to dig one foxhole or prone protective position for each man—*but we never achieved true protection*. This was not another case of the American boy preferring the backhoe to the pick and shovel; our soldiers worked hard during days that ranged from 18 to 21 1/2 hours. After a few days, the fatigue levels began to approach those which might be found in combat—minus the fear factor—but the crewmen still dug. That is, after each move, we dug some holes and dug in machineguns more or less properly, though not to textbook standards. We even managed some showy overhead concealment but no overhead cover.

Our holes looked good, and various "visiting firemen" complimented our ingenuity—but if we had been subjected to an airstrike or accurate counterbattery fire, we would have been badly hurt. Perhaps, if we had been real targets we would have done somewhat better with our earthwork. But, what if we had to dig fully garbed in our chemical protection overgarments and protective masks? And, what if we had to dig two or three times a day? I came away from annual training feeling that our battery had given field entrenchment as a survival tool a good shot, but that we had failed to really protect. In actual combat, the lack of overhead cover and a quick means of achieving it would have killed us. Holes are fine; but in the next war, without the all-important overhead cover, no section is going to survive long.

The towed gun crewman needs protection from almost the very minute he pulls into position—something that would give him a level of protection from overhead fire as quickly as he could snatch it off the truck and crawl under it. That something could be a soft multi-layered nylon or Kevlar blanket which yields at least as much fragment protection as the infantry's currently issued body armour. A blanket of this type by no means negates the need for an entrenched shelter, but it does give a measure of physical and psychological protection *up front, right now*. Ideally, a soldier should develop an eye for cover that becomes second nature, almost an unconscious habit, much as the experienced flier is always looking for forced landing sites as he travels along seemingly unconcerned.

Upon pulling into a position, one of the cannoneers should toss the blankets on the ground (one per man); the rest of the crew should steal whatever unoccupied seconds they can from their gun-laying chores and get at least a feel for where they are going if they get hit. Each crewman should take his blanket with him wherever he goes. Under fire the crewman lies flat on the ground and covers himself with the blanket.

If the section remains in a position long enough, it should begin entrenchment when the demands of the mission allow. In the improved position, protective blankets, by now supported by sticks and guyed by communications wire or layered between logs and earth, become the key building blocks of some really effective overhead cover.

A hint of the effectiveness of soft fabric armor can be gleaned from the report of the Army Body Armor Test Team studying casualties among Korean War soldiers wearing the prototype T-52-1 armored vest in 1952. The results of this study were published in the Army's Office of the Surgeon General's 1962 *Wound Ballistics* which states that, of soldiers struck while wearing the vest, 67.9 percent of all types of missile hits were defeated and that 75 percent of all fragment hits and 24.4 percent of all small arms missiles were rendered harmless. The study further states that the incidence of chest and upper abdominal wounds were reduced by 60 to 70 percent and that 25 to 35 percent of chest and upper abdominal wounds were reduced in severity. The extent of savings in life and limb from use of body armor and protective blankets can only be guessed, but they would be considerable in light of the knowledge that 65 percent of all World War II European theater casualties were caused by artillery.

The small fragments—the ones which range in size from a pencil lead to the tip of your thumb—are the real killers. Any exploding shell has many fragments; e.g., an 81-mm mortar shell will break into about 2,500 pieces.

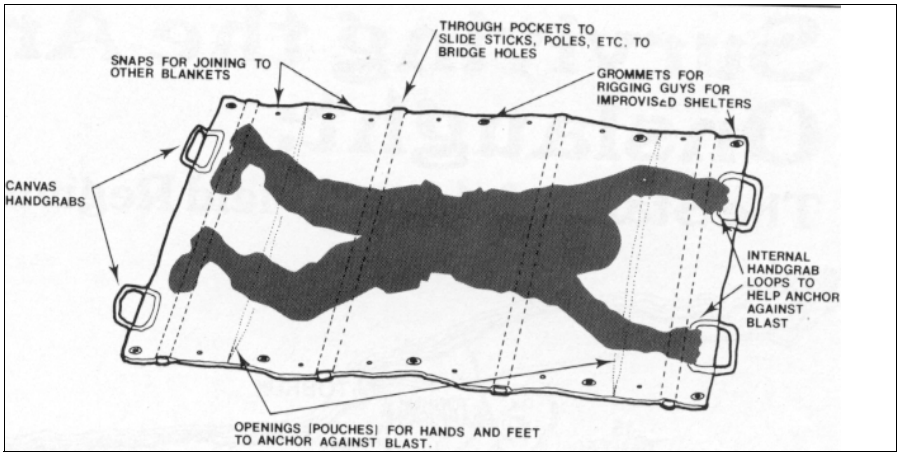


Figure 1. All-purpose protective blanket.

A protective blanket would be most effective against small fragments. It is not now feasible to protect against large fragments or direct small arms fire without incurring an unacceptable bulk and weight penalty. While it is beyond the scope of this article to attempt a final design or to establish the ballistic requirements of these blankets, I offer these thoughts on their construction which is further depicted in figure 1:

- The size of the blanket should be somewhat longer and about as wide as an Army sleeping blanket. Its texture should be soft enough so that excess material will drape to the ground around all sides of a prone figure lying under it to afford protection from horizontal hits.
- Two grab loops should be stitched at each end so that the blankets can be "snatched" or quickly handled.
- Hand and foot openings in the form of deep pouches or pockets with the openings facing the center should be provided at each end of the underside of the blanket so that a prone person can quickly jamb his feet into the pocket at one end and his hands into the other to anchor the blanket against blast. Internal grab loops should be stitched inside these pockets for hand holds. Pockets can be sealed with zippers or Velcro to keep dirt out when not in use.
- Ballistic protection should be at least equal to that of current issue infantry body armor.
- Films and foils can be sandwiched among the fabric layers for protection against nuclear, chemical, and napalm flash-burn threats.
- Grommets and snaps should be provided at many points around the perimeter to facilitate rigging of improvised and multipurpose shelters.
- Insert pockets for stiffeners should be placed at four or six points across the wide part of the blanket. Tent poles, sticks, extra aiming stakes, or a specially developed telescoping pole modeled after an automobile radio antenna could be slipped through these pockets to bridge an excavation.

There are many uses for such blankets. They could replace the issue air mattress for each crewman. Extra blankets could be lashed over cannon tires or tossed over sights. While on the move, an enterprising section could rig its blankets over the truck with scrap communications wire or spread them underneath for a measure of protection against land mines. Two or three bright lads could jointly dig a fighting position and cover it with their pooled blankets to get double or triple protection.

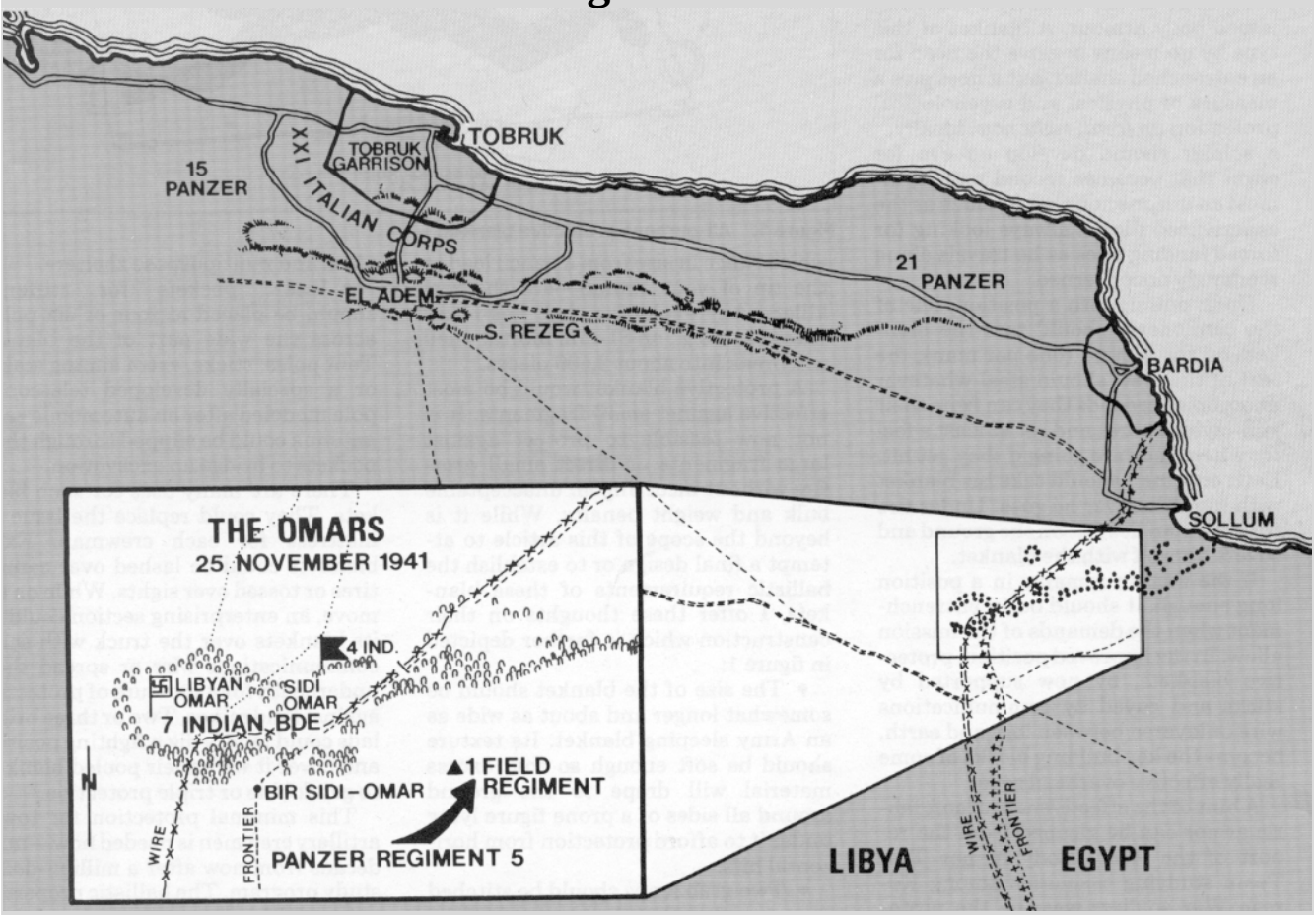
This minimal protection for towed artillery crewmen is needed now—not a decade from now after a million-dollar study program. The ballistic properties of layered fabric armor are already well known and are detailed in the US Army Material Systems Analysis Activity (AMSAA) Technical Report No. 381 dated December 1983 (Unclassified) which is obtainable from Director AMSAA, Aberdeen Proving Ground, Maryland 21065-5071.

What we need now is for someone to decide what protection level is needed, to find the appropriation, and to start cutting the cloth.

SGT Ward Wright served as a rifleman in the 1st Marine Division in Korea from 1954-55. He has an A.A. degree from George Washington University, and from 1960-66 was Associate Editor for *Aviation Week and Space Technology*. For the past nine years, Sergeant Wright has been a gunner with Battery B, 108th Field Artillery, stationed in Gettysburg, Pennsylvania. Battery B is part of the 28th Infantry Division (Pennsylvania Army National Guard).

Surviving the Armored Onslaught:

The Stand of the 1st Field Regiment



November 1941. German and Italians of Panzerarmee Afrika have Tobruk under seige and also occupy defenses along the Libyan-Egyptian frontier. OPERATION CRUSADER was the British plan to sweep past the Omars into the desert and fall on the rear of the Axis forces surrounding Tobruk.

by Captain John Gordon

In November 1941 the British 8th Army launched the largest Allied offensive to date in World War II—OPERATION CRUSADER. Its objective was to destroy the German-Italian *Panzergruppe Afrika* that was laying seige to the British garrison at the key Libyan port of Tobruk. Advancing across the Libyan-Egyptian frontier on 17 November, the British were soon engaged in a swirling, confused tank battle with the crack *panzer* units of the *Afrika Korps*. By 23 November most of 8th Army's armor had been smashed, and their foe, General Erwin Rommel, was looking for options to exploit his success. Rommel could remain on the battlefield near Tobruk and complete the destruction of the British armor, or he could strike toward the enemy.

Rommel was a daring opportunist, and the course he chose to pursue was to advance rapidly eastward into the British rear areas. His goals were to shatter the British supply system and relieve his German-Italian infantry manning frontier defenses who were themselves now under siege by Indian and New Zealand troops. History has labeled this audacious strike as Rommel's "Dash to the Wire," referring to the thick belt of barbed wire along the Libyan-Egyptian border. Ironically, this feat of maneuver was to lead to an epic duel of firepower: a tank versus artillery duel.

Beginning on the morning of 24 November, two German *panzer* divisions drove eastward, scattering surprised British supply columns and advancing 60 miles in 6 hours. Rommel planned to fall on the rear of the 4th Indian and New Zealand Divisions and envelop them the next day. If the plan worked, it would be a major disaster for the British.

On the evening of 24 November the men of the 1st Field Regiment, Royal Artillery, began to realize that something was amiss. Masses of British vehicles of all types were scurrying eastward.

Rumors that "German tanks are coming" were widespread. That night XIII Corps Headquarters sent a warning about approaching German armor, but the enemy was moving too fast and the situation proved too confused for anyone to have an accurate estimate of what was happening. The regiment, armed with 24 superb 25-pounder gunhowitzers, settled back to support the Indian infantry which was still attacking dug-in Italians.

On the morning of 25 November a British armored car raced into a 1st Regiment's gun position and reported that German tanks were approaching from the southwest. The 1st Field Regiment had no time to dig in its guns, but the crews did have cover in the form of slit trenches which they had prepared in case of an attack. These trenches proved to be a wise precaution; the Germans were indeed on the way.

The 5th *Panzer* Regiment had about 45 running tanks that day, mostly Mark IIIs with some heavier Mark IVs. They were planning to roll into the rear of 4th Indian Division, and as they neared the tiny village of Qineigina only the 1st Field Regiment stood in their path. The first few vehicles to spot the British guns fired a few rounds from about 2,000 yards and then moved off. To this there was no reply; the British gunners remained in their trenches. However, a major attack soon developed as the remainder of the *Panzer* Regiment appeared.

At about 0900 hours the British artilleymen spotted 28 tanks advancing at 3,000 yards. Arrayed in lines of 4 or 5 tanks each, the *panzer* unit was several waves deep. Due to excellent spacing between vehicles, almost all the tanks could fire as they advanced. When they were within 2,000 yards, the *panzers* opened fire. The British remained under cover as 50-and 75-mm tank rounds burst throughout their positions. Quickly closing the range, the 5th *Panzer* Regiment expected to sweep through the artillery position. Suddenly, when they reached a point some 800 yards from the British batteries, the German tanks came under intense fire.

The British waited until the Germans reached prepositioned range stakes at 800 yards—the optimum direct fire range for the 25-pounders. Jumping out of their trenches, the gunners poured rapid fire at the advancing tanks. At 500 yards the Germans halted and engaged the guns in a furious duel at virtually point blank range. Mixing high-explosive with armor-piercing shot, the 1st Field Regiment pounded the enemy tanks as fast as its crews could load. Twenty-four 15-pounders were firing 6 to 8 rounds per minute

A British 25-pounder in action somewhere in the desert in November, 1941. Normally, a 25-pounder gun section had an eight man crew.

A 25-pounder on the move. Ammunition was carried in the limber immediately in front of the gun, while the crew rode in the Morris Box Quad prime mover.

each. All the while guns were being hit and crews knocked out. The dispersed positioning of the British batteries facilitated all guns firing at the massed tanks to their front. For 10 minutes this incredible exchange continued. Finally, the Germans began to withdraw behind some nearby sand dunes where they could go hull down. For another 10 minutes the furious duel continued. Prime movers, limbers, supply trucks were being smashed throughout the British gun position, but the 1st Regiment's fire never slackened. High-explosive 25-pounder shells burst all around the German tanks as they tried to pick off individual British guns.

The climax of this desperate battle was reached as the 5th *Panzer* Regiment massed for a final charge. The 52d Battery was the westernmost and therefore the most exposed unit of the 1st Field Regiment, and it bore the brunt of the attack. Forty-three men in a battery of 73 were killed or wounded as the *panzers* charged to within 300 yards.

The British gunners' fire reached a crescendo as the Regiment poured nearly 200 rounds per minute into the advancing tanks. The massed response finally proved too much for the men of the *Afrika Korps*. Leaving eight burning tanks behind, the 5th *Panzer* Regiment hauled off out of sight to the south.

The 1st Field Regiment had stood its ground and prevented the Germans from driving into the rear of the 4th Indian Division. By late afternoon, 14 knocked-out German tanks lay in front of the Regiment's guns. The cost had been high. Five 25-pounders had been destroyed and others damaged. Eighteen men were dead and 44 more wounded. The regimental commander, Lieutenant Colonel Dobree, described the scene: "Damaged guns, bits of limbers, blown up ammunition, dead and wounded everywhere."

This action proved that an artillery unit could defend itself from an *unsupported* tank attack. Had the 5th *Panzer* Regiment been accompanied by artillery or motorized infantry, the resulting action may have led to the destruction of British artillery. The *Afrika Korps* learned its lesson. Never again would it charge tanks into a prepared artillery position.

For their part the British gunners were very proud. They probably saved the 4th Indian Division from a major defeat. In doing so they broke the momentum of Rommel's "Dash to the Wire," turned the tide, and laid the way for the British victory in OPERATION CRUSADER.

CPT John Gordon, FA, received his commission through ROTC at the Citadel in South Carolina. He is a graduate of the Field Artillery Officer Advanced Course and has served with the 82d Airborne Division Artillery, with the G3 of the 2d Infantry Division in Korea, and as a basic gunnery instructor. He is now commander of D Battery, 6th Training Battalion, US Army Field Artillery Training Center, Fort Sill, Oklahoma.

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Photo by LT Jeff Kline, USN

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