

Infantry

A PROFESSIONAL JOURNAL FOR THE COMBINED ARMS TEAM



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Infantry

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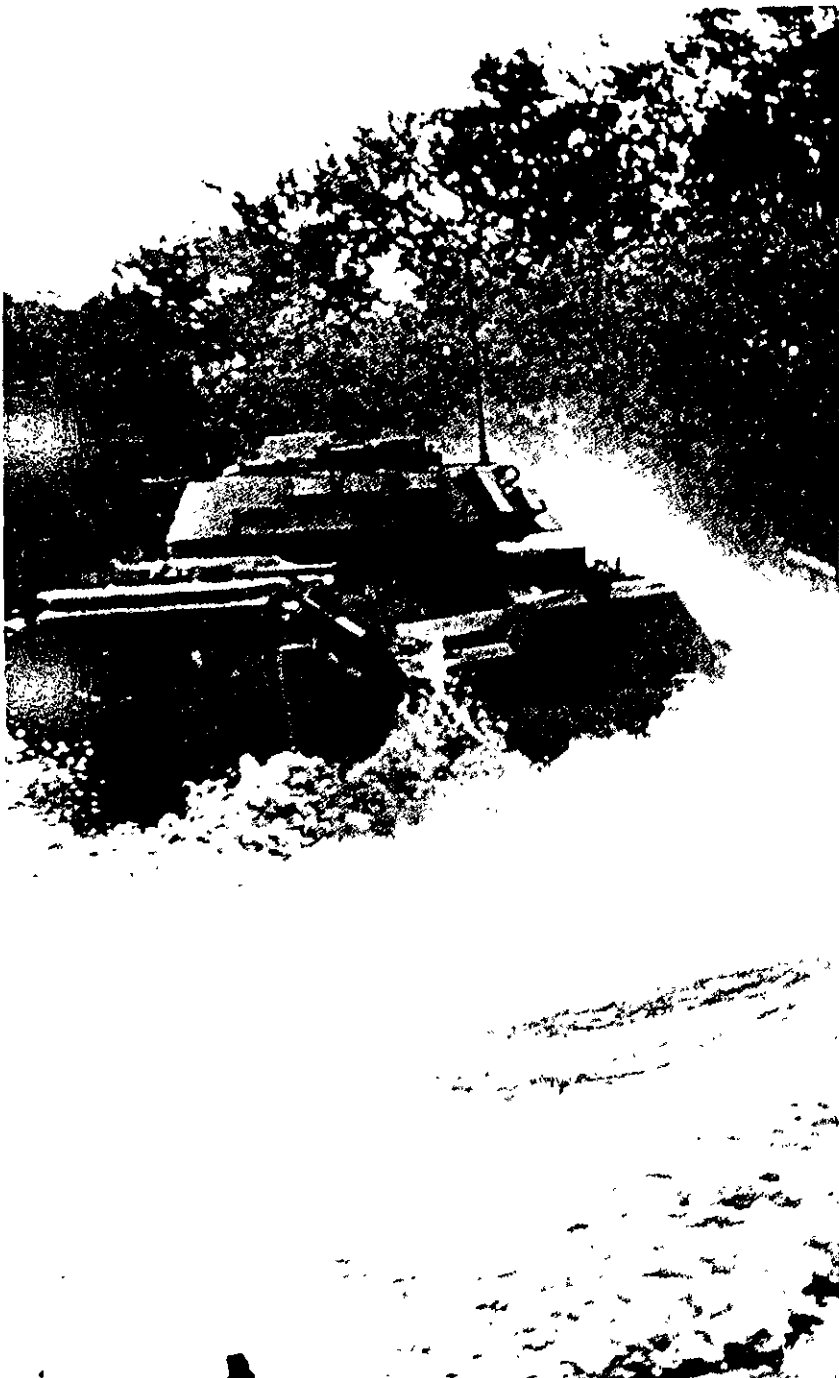
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FRONT COVER

The Bradley's firepower, speed, and armor protection, combined with its ability to carry infantrymen into battle, make it an extremely lethal fighting system.



USAIS

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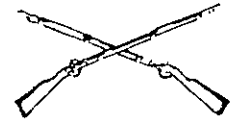
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Commandant's NOTE



Major General Edwin H. Burba, Jr.
Chief of Infantry

THE SOLDIER'S LOAD

"The Infantryman of nearly every army today groans under the pack that is required to be carried in campaign. To reduce that burden is a matter that should be a prime consideration of the designers and approving authorities of many arms and equipment and certainly should be foremost in the minds of those who prescribe the articles to be carried on the person of the soldier."

Do those words sound familiar? They probably do, but if they appear to have been written or spoken just recently, they were not. In fact, they were written by the editors of the old *Infantry Journal* for publication in their July 1926 issue.

Of course, these men were not breaking new ground or advancing a new idea. They were simply looking at an age-old problem and asking that someone in authority find a logical, workable solution to it for the U.S. soldier in the 1920s. No one did.

The same problem in its most basic form is still with us 60 years later, and we at the Infantry School have recognized the need to find a solution to it. In fact, for several years now our Rangers, light infantry task force people, combat developments folks, and doctrine experts from our combined arms and tactics department have spent a considerable amount of time studying the problem and—particularly in the case of the Ranger Department—testing new concepts.

I do not have the space in which to tell you in detail about all of the facets of our work, but from it we have drawn a number of significant conclusions:

- The ability of an infantry soldier to fight is directly related to the load he is required to carry. In other words, if we expect our soldiers to accomplish a combat mission successfully without incurring great risk, there is an individual load limit

that cannot be exceeded.

- An Infantryman cannot carry in combat the same load he can in training and still perform with the same efficiency.

- The *optimal* total load for a soldier has been determined to be 30 percent of his body weight. This translates to a 48-pound load for an average-sized soldier. His *maximum* load should not exceed 45 percent of his body weight, or 72 pounds.

- Load planning for the individual soldier takes on a special significance when a unit is required to move on foot during a specialized combat operation—raid, ambush, behind-the-lines mission—that is expected to last no more than 72 hours. In such an operation, a soldier must be completely self-reliant and must carry his necessary fighting gear on his body. (Even under the most severe weather conditions last winter at Dugway Proving Ground, Utah, for instance, the maximum weight of our Ranger students' rucksacks, including five MREs, never exceeded 27 pounds. Of course, this was in addition to their weapons, ammunition, and LCE. The light weight of the rucksacks came about mainly because the students had the new Goretex parkas and trousers, which will become CTA items for our light divisions sometime this year. For short-duration missions, those two items can replace sleeping bags, ponchos, poncho liners, rainsuits, cold weather parkas and trousers with liners, sleeping shirts, sweaters, and insulated underwear.)

- Sustained training with realistic loads is a proven contributor to combat readiness. The idea that training with heavier loads somehow will increase a soldier's combat readiness is no sounder than the idea that bleeding during training will increase his ability to withstand battlefield wounds. Our studies demonstrate conclusively that Infantrymen who are required

to carry heavy loads in combat will tire quickly after a short movement, thereby jeopardizing the combat mission.

- The loads our Infantrymen are usually required to carry today exceed the tolerable limit and drastically reduce their combat efficiency.

Why are our soldiers still being loaded like pack animals? Unfortunately, few of our Infantry commanders tackle this problem with much more than superficial results. The habit of carrying everything they needed for any eventuality, which many of them learned in Vietnam, has been a hard one to break.

There seem to be two persistent notions that lead commanders to overload their soldiers:

- "Be-prepared." Some commanders feel their soldiers must be prepared to meet every imaginable contingency.

- "The supply system will fail." Other commanders conclude in advance of an operation that the supply system will fail and therefore decide that their soldiers should carry twice as much of everything.

Infantry unit commanders must insist that their soldiers' loads—and their own loads—be stripped to the bare minimum. "The example must come from the top, and there must be no 'TOC palaces.'")

Commanders must demand that their men travel as light as possible and must examine every item to see if it is needed. They must also be willing to decentralize decisions on what goes into a load, with subordinate commanders being allowed to tailor their soldiers' loads based on their own METT-T analyses. They can be assured that if they do not reduce their

soldiers' loads, the individual soldier in combat will reduce his own.

Thinking light must be a philosophy for all types of Infantry units. Training light is the key. The mobility value gained by lightly loaded Infantrymen has been proved repeatedly. Commanders may be surprised to find how light their soldiers can travel, how few rations they will eat in combat, and how well a basic load of ammunition will do in the toughest fight. Of course, commanders must also train their soldiers to prevent cold weather injuries, malnutrition, disease, and equipment malfunctions. They must regain expertise in caches, trail parties, ORPs, fieldcraft, foraging techniques, and field expedients.

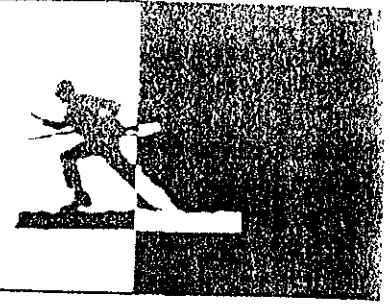
A commander cannot be prepared for everything, so he must take calculated risks. The bold commander who carefully analyzes the odds and demands the logistical support that makes load-tailoring and risk-taking an alternative to loading down his soldiers is the one who will win in battle.

Soldiers take great pride in operating under austere conditions. They live on challenge. As S.L.A. Marshall put it, "There were no lollipops in the early Central Pacific operations. Men fought on K rations, C rations, and lukewarm water. Yet morale was as high as I have ever seen it in the Army. That is the human nature of it. Troops will never miss what they don't expect, and, basically, they don't expect much. They will keep on to the limit if they get an even break with other men on the line. They will become stronger in the measure that their strength is tested."

Dare your soldiers—and yourself—to travel light.



INFANTRY LETTERS



MORAL DIMENSION

I would like to offer a slight correction and add to Colonel Richard F. Timmons' fine article "The Moral Dimension: The Thoughts of Ardant du Picq" (November-December 1985, p. 10).

The Prussian Carl von Clausewitz began working in earnest on his famous work *On War* about the time du Picq was born. And he, too, was very concerned with the moral dimension of war.

He devotes Chapter Three, Book One, of *On War* to a discussion of "military genius" and tells us that "the personalities of statesmen and soldiers are such important factors that in war above all it is vital not to underrate them."

His third chapter in Book Three focuses on "moral factors" in which he maintains that "moral elements are among the most important in war," and that "all military action is intertwined with psychological forces and effects."

Unfortunately, Clausewitz died prematurely in 1831, stilling his pen and leaving what in his own words was "a shapeless mass of ideas." Had he lived, he very well might have pursued the investigation of this critical dimension of warfare along lines similar to du Picq's.

FREDERICK ZILIAN, JR.
LTC
Navy War College
Newport, Rhode Island

PRINCIPLES

It was at first with great interest and then with dismay that I read "On Being a Lieutenant," by Captain Richard D. Hooker, Jr., in *INFANTRY* (November-December 1985, p. 20).

Throughout the article, Captain Hooker offers various principles on how to deal with certain individuals or classes of individuals within a company. No-

where did I note the principles of honesty, loyalty, dedication, or self-sacrifice. Most of my fellow soldiers, Active and Reserve Component, value these character traits in our leaders much more than a sense of humor. This is not to belittle the need for a sense of humor in our leaders but rather to place it in perspective.

In general, Captain Hooker appears to place a higher value on a style of leadership that will insure his career than on the timeless style of military leadership that is summarized as "men first, mission always."

DOUGLAS N. BERNHARD
CPL

Washington Army National Guard
Kirkland, Washington

PUT MYTH TO REST

Reference the January-February 1986 issue of *INFANTRY* Magazine, in the Officers Career Notes section I note that "assignment officers may be able to help [officers] get assignments that will make it easier to get a degree, such as tours as ROTC instructors."

After reading this revelation, I immediately called Infantry Branch at MILPERCEN and asked to talk to the rascal who originated that statement. My intent was to have him tell my boss that I was in this "easy" assignment to get my master's degree. The branch representative to whom I spoke quickly assured me that the statement was erroneous and that all assignment officers had been instructed not to brief Infantry officers on easy degree programs as an inducement to accept ROTC assignments.

Let us put the myth to rest. ROTC is not a quick route to post-graduate degrees. What ROTC is is a demanding, challenging, enlightening, rigorous, satisfying, difficult, rewarding, motivat-

ing, and exciting assignment. It is also one of the most sobering experiences of an Army career.

One term that every Infantry officer understands is "mission." Over the past couple of years the mission for Army ROTC has changed. Consider the impact on a system that normally produces 8,000 officers a year when the mission is increased to 10,000 per year with no decrease in quality and no increase in training assets.

Although Infantry Branch is no longer promising degrees as an incentive for ROTC assignments, it does not have a solution to promotion and selection boards looking at files. Consider the reaction of board members looking at the file of an officer who just completed a three-year assignment with Army ROTC but does not have a master's degree, even though *INFANTRY* Magazine suggests it is automatic in this "easy assignment."

In an ROTC assignment the myth of a master's degree is just that. The challenge of accomplishing an important mission with few assets is the reality. Officers should fight to get the assignment for all the right reasons.

DAN GRIGSON
MAJ, Infantry
Temple University
Philadelphia, Pennsylvania

PICKETT'S (?) CHARGE

Sergeant Stephen Z. Bardowski's letter on the image of leadership contains a serious historical error (*INFANTRY*, January-February 1986, p. 5). In his statement that "General Pickett's plumed hat thrust high on his saber, heading for the angle at Gettysburg," served the purpose of letting his men know he was in charge, Sergeant Bardowski confuses the issue of "Pickett's Charge" and the man who actually led the assault on the angle.

General Lewis Armistead, one of Pickett's brigade commanders, was the man who led the heroic but foredoomed assault into that clump of trees, since immortalized as the high water mark of the Confederacy. General Pickett was never in the vicinity of "the angle," nor did he lead the assault named after him.

Let us give the heroic dead their just due.

ROBERT G. SMITH
LT, Armor
Fort Hood, Texas

SOLDIER'S LOAD

I would like to congratulate Captains Stephen P. Perkins and Christopher S. Barnthouse on two fine articles on the combat load of the American soldier in your January-February 1986 issue ("Standardize Combat Load," p. 16, and "Infantry in Action: Sustainability," p. 27).

Captain Perkins refers to the tendency of commanders to load their soldiers down with supplies to meet every eventuality and recommends a reduced combat load suited to actual need instead of possible need.

I agree with his recommendation that the standard combat load of the infantryman be reduced. From my own experience I can recall movements to contact in the noon heat of the Mojave Desert in which each soldier carried a rifle, seven magazines of ammunition, a flak jacket, a steel helmet, two canteens of water, a first aid pouch, two ammunition pouches, a poncho, and full marching pack filled with boots, uniforms, underwear, soap, and razor blades. Just carrying these loads made many of us sag like old men, and by the time we reached our objectives (sometimes miles away) we were often too exhausted to carry out our assaults with the proper speed and aggressiveness.

On one particularly long movement, I can recall mass heat casualties with a good part of the battalion incapacitated and requiring medical evacuation. Needless to say, our tactical movement became a rout to the cantonment area. Such occurrences are an unnecessary embar-

rassment to military commanders and could be alleviated with a little common sense.

Captain Barnthouse cites historical examples in which excessive loads carried by U.S. soldiers actually inhibited their movement under fire and contributed to the sustainment of mass casualties in combat.

He points out that soldiers lose energy not only because of these heavy combat loads but also because of fear. Many of us can probably recall a time when a pervasive fear weakened us beyond the level that could be attributed to our physical exertion. This factor, too, must be considered in loading the combat soldier.

Ideally, this soldier should be concerned with moving only two items — himself and his individual weapon. All logistical items such as rations, ammunition, and medical supplies should be staged in rear areas and transported by support personnel, not by combat troops on the move.

Again, my congratulations to these two authors. I only hope the Army listens to them.

EDWARD PASCUCCI
Cadet, ROTC
Syracuse, New York

GUIDELINES

I would like to comment on Captain Stephen P. Perkins' "Standardize Combat Loads" in your January-February 1986 issue (p. 16).

Captain Perkins has obviously devoted a good deal of time and analysis to the question of the individual soldier's combat load. His argument is generally sound and his research is thorough, but he has set himself an impossible task. There is no such thing as a standard, Army-wide soldier's load, and it is foolish to maintain that our Army needs such a standard, *especially* for light infantrymen.

The one enduring principle governing the composition of the individual soldier's load is that it is utterly dependent on the factors of METT-T. Clearly, a light infantryman operating in Norway in the winter would bear a load significantly different from that of a soldier

fighting guerrillas in Central America. The light infantryman holding close terrain in Europe against a mechanized Soviet threat would organize his individual load much differently from the way a soldier deployed to a jungle or a mountainous theater of operations would organize his. Captain Perkins attempts to circumvent this principle by establishing five "restrictive assumptions." In so doing, he creates a completely artificial environment that ignores the lessons of history.

For instance, he assumes that "operational weather will remain moderate." A cursory look at modern light infantry operations shows that light infantry is more often than not intended for use in areas where the weather is anything but moderate — hot jungle, cold mountains, arctic tundra, desert — these are the environments where light infantry forces have been most active and where we can expect our own light forces to operate.

Consider the Chindits of the Burma Campaign in World War II. They conducted harassing attacks and interdiction against the Japanese rear area for months at a time in 1943 and 1944. Resupplied every five days or so by airdrop (primarily), the Chindits carried a load that averaged about 70 pounds per man. Because their operations took them over steep jungle trails and through almost impenetrable bamboo thickets in extreme heat, these 70-pound loads seemed unbearable. Yet they were absolutely necessary, given the mission, terrain, climate, and limits on resupply.

A few years later, the British infantry fought insurgents in Malaya and Indonesian raiders in Borneo. The changing situation then enabled them to reduce the individual load to an average of 50 pounds per man. In Borneo, the British SAS commanders were able to insist that the packs of their men be weighed before moving out on extended operations to see that no man carried more than 50 pounds. Experience tailored the load. Nobody, for instance, wore underwear in the jungle. Only two uniforms were carried. The clean one (sometimes a black jumpsuit-type coverall) was worn at night to sleep in. The wet, dirty one was redonned in the morning. Helmets were left behind in favor of jungle hats. Poncho-type

sheets substituted for sleeping bags, shelter halves, and ground covers. Nobody needed gas masks, gloves, sweaters, or field jackets.

Conversely, in extremely cold weather, it is hard to imagine that a soldier could avoid a load of 100 pounds or so, particularly if traveling cross-country over snow. Survival alone would demand heavier clothes, more fuel, skis, snowshoes, and such items.

Instead of standardizing an individual combat load, Captain Perkins would do better to advocate adhering to a few well-chosen guidelines. I offer a few for consideration:

First, every effort must be made to lighten the soldier's load through technology (lighter rations, lighter ammunition, lighter clothing) and ingenuity. Leaders at high levels must make a point of responding to the ideas of their subordinates on this matter.

Second, soldiers must be trained to do without the things they think they "need," and first-line leaders, platoon sergeants, and junior officers must be absolutely ruthless about what soldiers put in their rucksacks. Experience will go a long way toward training the soldiers, but leaders must constantly check and make corrections. Many soldiers, for example, will fail to carry enough water, and some will short themselves on ammunition.

Third, when the situation changes, the SOP should also change.

Finally, when the need for an item is in doubt, the soldier probably can get by without it. Food is a good example. Rations can be stretched, and the environment can usually be counted on to provide some sustenance. In many situations, light infantrymen can use the enemy's resources.

Above all, the light infantryman must not be so loaded down that he is continuously exhausted, inattentive, and unready to practice his craft. Observing these guidelines, I think, is a better approach to the problem of the individual combat load than trying to establish an Army-wide standard.

SCOTT R. McMICHAEL
MAJ, Field Artillery
Fort Leavenworth, Kansas

RE-ARM M113

The M113-series armored personnel carrier is a grand and venerable vehicle, and many units will be equipped with it for some time to come. There is a problem, however, with its firepower — its M2 .50 caliber machinegun.

This weapon, when fired from a tripod (anchored with a traverse and elevation mechanism), is extremely accurate out to more than 1,600 meters. In its free-mount mode (non-anchored, pintle mounted) as it is on the M113, however, it is far less effective. Because of the recoil produced by the rapid firing of such a heavy bullet, not one in ten gunners, even with a significant amount of practice, can hit a target accurately at long range. In other words, a mechanized infantry platoon must close to within 500 or 600 meters to deliver effective support to another platoon. What good is fire support at such a short range to a unit that by its nature fights over much greater distances? And, of course, when a crew buttons up to protect itself from artillery, it loses *all* of its firepower.

The answer to these problems lies in history — with the M114A1 armored reconnaissance vehicle. It, too, had the M2 .50 caliber machinegun, but in a simple, hand-cranked cupola. The M2's backplate was simply removed and stored, and the gun was then slid into a cradle and anchored. In the back of the cradle was a solenoid, which when actuated pressed up on the trigger bar in the same manner as achieved by the manual butterfly trigger. The cupola was manually operated and had two crank handles — one for elevation and one for traverse. On one of the handles was a thumb switch that activated the trigger solenoid.

The weapon had three sights available: the normal integral iron sights on the receiver and barrel; a concentric ring anti-aircraft sight; and a tubular iron sight that hung below the cradle (since it was visible through the vision blocks on the cupola, it could be used when the crew was buttoned up).

This same kind of manual cupola could be added to the M113 at little cost, and its advantages would be remarkable. With the weapon anchored, its accuracy at maximum range would be restored,

thus allowing the platoon a much greater degree of stand-off in fire support on an objective or in overwatch when maneuvering. In addition, the weapon could then be used when the gunner was buttoned up, enabling the mechanized platoons to maintain suppressive fires at the critical stages of an assault. The weapon's use in a ground mount would not be affected; it would simply be removed from the cradle, and its backplate would be replaced.

To speed the availability of the cupola to the field, it could be developed as a kit, to be installed under a modification work order by direct support units. The time and cost for development could be avoided by using the plans for the M114A1 as a basic cupola design. (This is fundamentally the way the turret traverse mechanism for the M901 ITV was built — from the turret traverse used on the M114A1E1 and its powered cupola.)

For only a few hundred dollars a vehicle, we could multiply the effectiveness of our M113-equipped units many times over. The cupola might not be glamorous, but it would work — and it could be ready almost immediately.

BARTON L. PEARL
MAJ, Infantry
Hq, U.S. Army, Europe

USE OF ENGINEERS

I was disappointed by Major Robert J. Henry's article, "An Execution Matrix" (INFANTRY, September-October 1985, p. 34) — not because of his proposed matrix but because of his employment of the engineer platoon. I know he was only including the platoon for the purpose of his example, yet he demonstrates a mode of thinking that engineers and the engineer branch have been trying to eradicate for years.

The purpose of giving the engineer platoon to Company B was "to help the commander dig in his company." With three squads, four M113s, and a five-ton dump truck, the only thing they can dig in with is shovels. That's an inefficient, labor intensive, time-consuming effort.

The best use of that engineer platoon is out front emplacing obstacles and rein-

forcing the terrain, thereby increasing the lethality of the engagement areas. A good engineer platoon leader will advise the task force commander appropriately, but a better knowledge of engineer capabilities and employment will greatly improve the results when a maneuver commander uses his number one combat multiplier, the engineers.

KURT E. NYGAARD
CPT, Engineer
Fort Hood, Texas

25th INFANTRY REGIMENT

I am seeking information on anyone who was assigned to the 25th Infantry Regiment, made up entirely of black soldiers, in order to plan a reunion of all the regiment's remaining people.

Anyone who has this information may write to me at 1563 Warbler Avenue, Sunnyvale, CA 94087.

HANK WINN
COL, Retired

FIRST DIVISION

The Society of the First Division, composed of veterans of the Army's First Infantry Division (Big Red One), has

announced that the group's 1986 reunion will be held in Buffalo, New York, 3-7 September 1986.

Previously, the reunion had been scheduled for Charleston, South Carolina, but plans changed and the 1987 meeting will now be held there.

Information about either meeting can be obtained from the Society at 5 Montgomery Avenue, Philadelphia, PA 19118; telephone (215) 233-5444.

SOCIETY OF THE FIRST DIVISION

222d INFANTRY REUNION

A reunion of the 222d Infantry, 42d Infantry Division will be held at the Holiday Inn and Helidome West in Oklahoma City, Oklahoma, 9-12 July 1986.

Anyone who is interested may contact Al Brewer, P.O. Box 242, Mustang, OK 73064.

JAMES McNICOL

SPIRIT OF AMERICA

"Spirit of America," the patriotic extravaganza that has thrilled Washington audiences for many years, will be performed 11-15 June at the Capital

Center in Landover, Maryland.

Daily performances will be at 8 p.m., with added performances at 2 p.m. on 14 and 15 June.

These performances are free, but because of the great demand, tickets are required. They can be obtained from Spirit of America, Fort Lesley J. McNair, Washington, DC 20319-5050. Dates and times desired must be specified in the order.

PUBLIC AFFAIRS OFFICER
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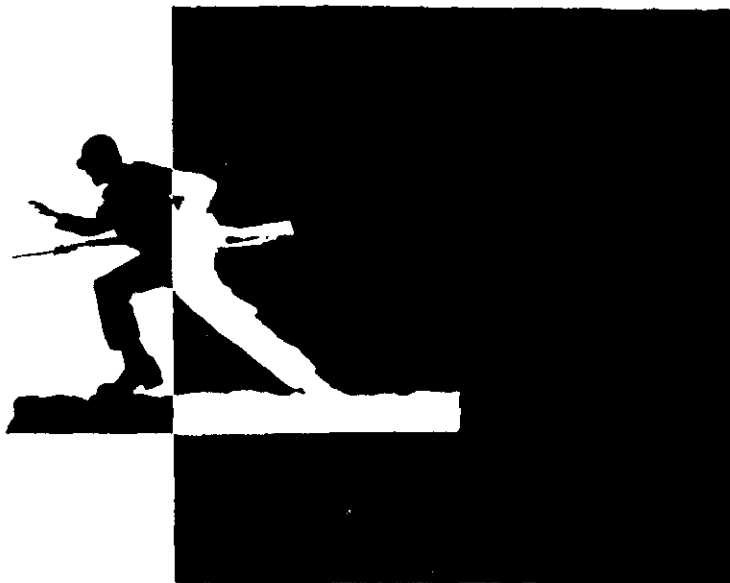
INFORMATION SOUGHT

I am a freelance writer searching for military and civilian personnel who served in Laos and Cambodia during the Vietnam War — military aviators and intelligence officers, ground troops, CIA personnel, Air America pilots, MIA families, indigenous forces, U.S. Government authorities, and others.

The information collected from these people will be used for a history book and some related articles.

Please send letters in confidence to me at 4229 Albermarle Street, NW, Washington, DC 20016, or call (202) 966-2346.

MICHAEL REED



INFANTRY NEWS



TWO DRILL MANUALS for Bradley squads and platoons have been developed by the U.S. Army Infantry School — TC 7-8, Bradley Fighting Vehicle Crew Drills, dated December 1985, and FC 7-21B, Bradley Infantry Fighting Vehicle Squad and Platoon Drills, dated May 1985 (with an errata sheet dated 29 July 1985).

Because the basic level of tactics for Bradley infantry is the platoon, most of these drills are oriented at platoon level. Some of them, however, are written to be applicable to both squad and platoon levels. This enables a squad leader to train his soldiers on their portion of a drill within the context of a platoon drill or operation. A few drills, such as "Conduct Initial Breach of a Mined Wire Obstacle," focus only on the squad. (See INFANTRY, July-August 1985, pp. 2-3, for details on Bradley organization and tactics.)

TC 7-8 provides a set of drills for the Bradley crew that are oriented on the Bradley system (both M2 and M3), including its weapons. FC 7-21B provides a set of battle drills and tactical drills (referred to in the FC as tactical training drills) for the Bradley squad and platoon leaders.

Battle drills are rapid, reflexive, immediate-action responses by a small unit to a critical combat situation. They are designed to be done the same each time to one Army-wide set of performance measures. Battle drills provide small units (team, squad, section, platoon) with a course of action they can take spontaneously in response to enemy contact (direct or indirect) or to the likelihood of contact in order to survive and win on the battlefield. They require minimal consideration of METT-T conditions or leader actions.

Tactical training drills are collections of critical individual or leader tasks that require quick but not immediate action responses to enemy contact. These drills

require more extensive consideration of METT-T conditions and leader involvement than battle drills.

FC 7-21B is to be converted to Training Circular (TC) 7-21B with a projected fielding date not later than December 1986. It will be available on pin-point distribution, and units can requisition the number they need. TC 7-21B will show which drills are considered battle drills and which tactical training drills. Meanwhile, an interim message has been sent to the field with this information. (See "Drills," INFANTRY, July-August 1985, for more details on the characteristics of drills and how to conduct drill training.)

THREE COURSES now offered at the U.S. Army Infantry School train personnel on the technical and tactical aspects of the Bradley Infantry Fighting Vehicle:

The BIFV Commanders Course trains personnel in BIFV-equipped units in the skills they will need to operate and maintain the total system as well as to engage targets. The course provides transition training for squad leaders up through company commanders in the individual and collective skills they will need to perform their duties in a BIFV unit. The training includes maintenance, gunnery, and tactical tasks.

The BIFV Gunners Course prepares selected enlisted personnel to serve as gunners on the BIFV. It provides progression training for soldiers in MOS 11M and transition training for those in MOS 11B20 to become proficient in Skill Level 2 gunnery tasks.

The first phase of training instruction and practical exercise includes turret operation and maintenance along with weapons operations and maintenance. The second phase develops the gunnery skills a student needs to acquire and defeat threat targets. This training culminates in live fire training exercises.

The BIFV Master Gunners Course prepares a selected number of highly qualified noncommissioned officers to assist BIFV company and battalion commanders in planning and implementing gunnery training programs and maintenance training (turret and fire control).

Active Army and Reserve Component sergeants, staff sergeants, and platoon sergeants/sergeants first class who are qualified in MOS 11M and who are assigned to BIFV units are individually selected by the battalion commander to attend.

A BIFV Master Gunner receives extensive training on maintenance, gunnery, training management, range preparation, and tactics. (See article in this issue for details of this training.)

LIGHT INFANTRY field circulars, posters and infantry material without numbers are available to units from the Training and Support Division, Office of the Secretary, USAIS, Fort Benning, AUTOVON 835-2141/1823 or commercial 404/545-2141/1823.

Units with questions pertaining to the light infantry concept may write to Commander, USAIS, ATTN: ATSH-I-V-LITF, Fort Benning, GA 31905-5007, or may call AUTOVON 835-4590/5298 or commercial 404/545-4590/5298.

THE FOLLOWING NEWS ITEMS were furnished by the Directorate of Combat Developments:

- **TOE 07245J410.** The Bradley-equipped mechanized infantry battalion table of organization and equipment (TOE) has been adjusted several times since the Division 86 study group formulated the design. Most of the changes have been made under the banner of Army of Excellence (AOE). These changes, completed during October 1983, streamlined the battalion's combat

service support while reducing robustness and resiliency.

Several new changes were implemented during the most recent cyclic TOE update in October 1985. These were made to align the battalion's TOE, as much as practical, with the TOE of an M1-equipped tank battalion. The most significant changes made to the Bradley battalion are the redistribution of the administrative/logistical command post vehicle from the S-1 section to the S-4 section and an increase in the number of pack radios for the transportation section of the support platoon. Additional changes either implement agreements for the basis of issue of night vision goggles and camouflage nets or are administrative in nature.

Future versions of the TOE will incorporate the combat field feeding system (CFFS) and will add master gunners to the rifle platoons. A platoon master gunner will be the platoon leader's present gunner, but that NCO's rank will be raised from sergeant to staff sergeant. He will also be a graduate of the master gunner's course and will become the rifle platoon's primary gunnery trainer.

The CFFS will give the battalion 16 food service personnel, 4 two-and-a-half ton trucks, 2 mobile kitchen trailers, and 8 water trailers. It will require augmentation in unit dining facilities for garrison feeding; in the field, the system calls for the operation of two teams, each of which can provide one hot tray pack and two MREs daily to the battalion's soldiers.

• **Bayonet.** A new multipurpose bayonet is expected to be issued to the field in October 1987. It is a significant improvement over the present M7 bayonet in that it has a wire-cutting capability and can be used as a combat field knife. (See *INFANTRY*, January-February 1986, page 9.)

The initial issue of the new bayonet will be restricted to infantry units, to close-combat forces in Special Forces operational battalions, and to selected combat engineer units.

• **SMAW.** The Directorate recently established requirements to field the shoulder-launched multipurpose assault weapon (SMAW) as an interim weapon for the multipurpose individual munition. The SMAW is in production and has

been fielded by the U.S. Marine Corps.

The SMAW was designed for use against fortified positions, but it has also been found to be effective against light armored vehicles. It consists of two major components — a launcher and an encased dual-mode warhead.

Priority of issue will be to light infantry forces (light infantry battalions, Rangers, and airborne and air assault units). The weapons will be used by dedicated antiarmor teams in the arms room concept as an alternative to the Dragon. Based on the expected threat, a commander will decide which weapon will be deployed into an operational area.

FORT KNOX SUPPLEMENTARY Material 17-3-2, *Armor in Battle*, has been published by the Armor School. It is a 240-page anthology that discusses small unit armor actions from 1916 to the present.

Copies of FKSM 17-3-2 may be obtained from the Army Wide Training Support Branch, Fort Knox, KY 40121; AUTOVON 464-2914/5715 or commercial (502) 624-2914/5715. The FTS number is 354-2914/5715.

More information about this publication is available from Captain Gregory Smith, Leadership Branch, USAAS, Fort Knox, KY 40121; AUTOVON 464-5450 or commercial (502) 624-5450.

THE 205TH INFANTRY BRIGADE, U.S. Army Reserve, has been designated the roundout brigade for the new 6th Infantry Division (Light) in Alaska. Each division in the roundout program has two Active Brigades and one Reserve Component. All of the Army's other roundout brigades are National Guard units.

Headquartered at Fort Snelling, Minnesota, the 205th is in one of the coldest regions of the continental United States and has the special cold weather equipment required in Alaska. It also has had previous planning and training relationships with the Active Army's 172d Infantry Brigade, which is based in Alaska and which will form the nucleus of the 6th Division.

The major units of the 205th that will convert to the new light structure include

the 3d Battalion, 3d Infantry; the 1st Battalion, 410th Infantry; and the 3d Battalion, 14th Field Artillery.

When fully organized, the 6th Infantry Division (Light) will consist of a headquarters and headquarters company, three light infantry brigades, a division artillery, a combat aviation brigade, a division support command, and various support units.

THE PRESIDENT OF THE U.S. Army Infantry Board has given us the following news items:

Squad Automatic Weapon. A joint working group met at Fort Benning in September 1985 and proposed a series of modifications it felt should be made to the squad automatic weapon (SAW). It was determined that those modifications that could be made within six months would be tested by the Infantry Board during a concept evaluation program (CEP) test in December 1985, and that those modifications that required longer than six months to complete would be tested at a later date.

These were the modifications that were tested by the Board in December 1985:

- Changing the zeroing procedures so that the front sight can be adjusted by a spanner wrench that will be made available at the unit level.

- Increasing the clearance between the rear sight plate and sight knobs and replacing the detent pins with ball bearings to permit freer movement and better wear.

- Removing the link ejection port cover to eliminate the danger of the gunner's cutting his hand on it.

- Correcting magazine feed well tolerances and emphasizing the magazine insertion procedures listed in FC 23-10 to reduce the number of stoppages.

- Increasing the spring tension in the bipod to retain the bipod legs in the folded position.

- Crimping the last coil of the firing pin spring to prevent the inadvertent separation of the spring from the firing pin.

- Testing an improved tracer round that had a brighter signature and longer trace duration.

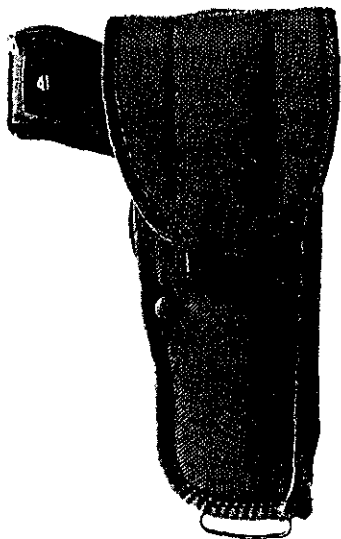
The test results will be used by the

Infantry School during its evaluation of the SAW modifications.

Testing of the additional modifications is planned to take place in July 1986. Among those modifications will be a barrel heat shield.

A CONTRACT WAS AWARDED recently to a commercial concern to produce the new official U.S. armed forces M-12 standard hip holster for the newly adopted 9mm handgun.

This ambidexterous holster features a completely modular design, allowing it to be worn on a wide or narrow belt, with or without flap, on belt or shoulder, and cross- or side-draw. The new holster is



made of an olive drab ballistic nylon fabric outer facing over a non-absorbent, closed-cell polyfoam core. It weighs eight ounces, is water resistant, and incorporates a flexible cleaning rod for the pistol's barrel.

The contract also calls for refining the M13 chest harness, which will enable a wearer to convert the M-12 from a hip holster to a chest holster for use in tanks and other military vehicles.

A pistol magazine pouch that incorporates the holster's quick-lock belt fastener is also included in the contract.

THE DIRECTOR OF THE National Infantry Museum at Fort Benning has furnished the following news items:

A French 75mm artillery piece and

caisson has been restored and displayed on the Museum grounds. Designed in 1897, this model weapon played an important role in World War I. It was considered the finest field piece in the world at the time because of its mobility and accuracy and the fact it could spit out 15 to 20 rounds a minute. In a postwar demonstration at Aberdeen Proving Grounds, a crack American gun crew achieved a firing rate of 25 rounds a minute. By World War II, however, a number of artillery pieces had been developed that outmatched it.

A Union sharpshooter's .50 caliber sniper rifle with telescope has been added to the Museum's Civil War section. It is part of a collection of articles used by Sergeant J.C. Nobel of Albion, New York, who was a member of Company G, 1st Battalion, New York Sharpshooters from August 1862 to June 1865. Other items in the collection are the bullet mold and powder flask that Nobel used, and letters that he wrote to his wife during that time. Also shown is a pair of wire-rimmed sharpshooter's glasses. Made especially for snipers, they have only a small circular viewing area cut in the lenses.

New additions to the airborne display section are a rare "balloon cloth" jump suit that was introduced in late 1941 by the 501st Parachute Battalion, and the jump uniform worn by Sergeant Hiram Duncan, Company E, 2d Battalion, 503d Parachute Infantry Regiment during a World War II combat jump into Markham Valley, New Guinea, on 5 September 1943.

Other recent acquisitions include a hunting knife used by a member of Merrill's Marauders in the China-Burma-India theater of operations during World War II; an unusual Nazi political flag that was taken by the donor in 1943 from the Bank of Rome Building in Naples, Italy; a World War II British parachutist's jacket; a Viet Cong flag captured by Advisory Team 43 in the spring of 1963; the uniform and jump boots worn by Colonel John B. Pratt when he parachuted onto Noemfoor Island on 4 July 1943; a pipe that belonged to Frank Merrill; some Chinese arrows that were fired at U.S. Infantrymen during the Boxer Rebellion; and a German MP40 subma-

chinegun captured at Anzio during World War II by a member of a Ranger unit.

The National Infantry Museum Society, formed at Fort Benning a number of years ago to assist the Museum with financial and volunteer support, is open to anyone who is interested in joining. The cost is \$2.00 for a one-year membership or \$10.00 for a lifetime membership.

Additional information about the Museum and the Society is available from the Director, National Infantry Museum, Fort Benning, GA 31905-5273, AUTOVON 835-2958, or commercial 404/545-2958.

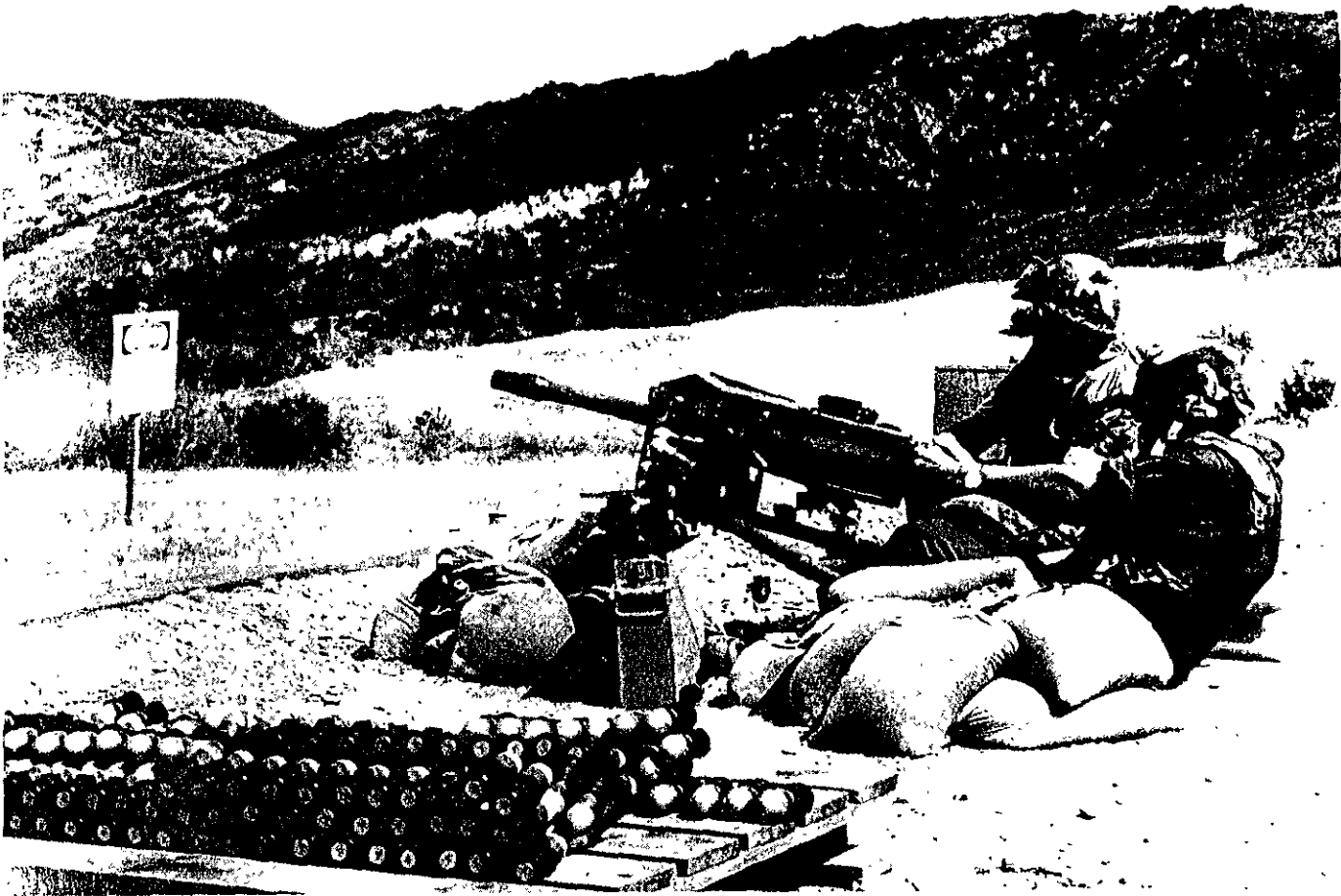
THE ARMY MATERIEL COMMAND (AMC) has chartered a product manager (PM) office for mortar systems. This office, called PM Mortars, is responsible for managing all mortar systems, including developing, producing, fielding, and supporting 6 weapon systems and 79 munition items.

It is located at the Armament, Munitions, and Chemical Command's Armament Research and Development Center, Dover, New Jersey.

A 40mm GRENADE MACHINEGUN used for some time by the U.S. Navy has been modified for Army use by the Armament, Research, and Development Center (ARDC). The weapon was developed in response to the 9th Infantry Division's need for a lightweight, man-portable weapon that could be used against enemy troops and lightly armored vehicles. Although the Navy weapon met that basic need, the gun required some modification to meet the extreme climatic conditions Army units expect to encounter in combat.

The modified version, a fully automatic, air-cooled machinegun, has a firing rate of about 350 rounds per minute. It is a multipurpose gun — antimateriel and antipersonnel — that can be used for offensive and defensive operations such as protection during movements of troops and supplies.

In addition to the ammunition currently used in the grenade submachinegun, the



Soldiers field test the 40mm grenade weapon system.

ARDC has developed a dual-purpose round to meet the weapon's antimateriel and antipersonnel requirements. This ammunition is now in production.

Upon detonation, the grenade projectile can fulfill its two missions simultaneously: A penetrator, formed by the force of the detonation, will destroy most lightly armored vehicles at a maximum effective range of about 1,500 meters (with an overall range of 2,200 meters); and the grenade projectile's serrated body

will break into many small fragments, disperse, hit, and incapacitate enemy soldiers within a 15-meter radius of the point of detonation.

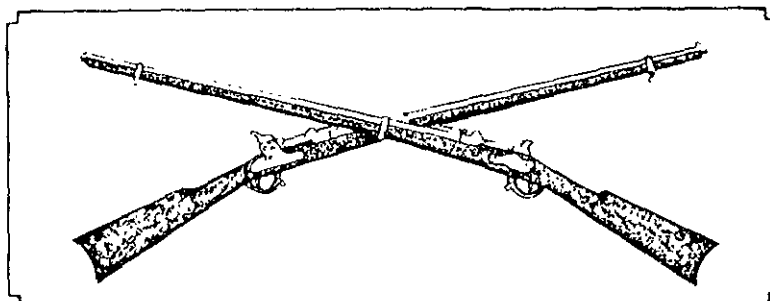
A practice training round has also been newly developed to simulate the flash, smoke, and sound of the grenade.

The grenade machinegun with its required ammunition can be transported easily on jeeps, trucks, or armored personnel carriers. In the 9th Division, it will be mounted on high mobility multi-

purpose wheeled vehicles (HMMWVs).

Because the weapon is lightweight, 7.6 pounds, two people can remove it from a vehicle mount and set it up on a ground mount within five minutes. Gunners zero in on and attack a target by firing three-to-five-round bursts.

The 9th Infantry Division is scheduled to get about 200 of these grenade machineguns with ammunition this summer.



FORUM & FEATURES



The Best Kept Secret

COLONEL FREDERICK PETERS

Some dramatic changes have been made in the Infantry Officer Basic Course (IOBC) in the past ten years — and with them also some changes in the role of the officers who are assigned to conduct that training. Still, too few Infantry officers fully understand what is involved in training newly commissioned lieutenants to take their places in the Army.

As a result, we at the School Brigade of the Infantry School must spend considerable time explaining it to everyone involved. This includes the majors and captains who are being considered (or have been nominated) for jobs as company commanders and platoon trainers in the Brigade's 2d Training Battalion. More important, it also includes the personnel managers and assignment officers at MILPERCEN who manage the careers of these officers and also the senior officers who must advise them and make critical decisions about their futures.

Today's IOBC is not the course many infantry officers will recall. Gone are the days when IOBC students were given most of their instruction in classrooms in Infantry Hall with a 1:100 or 1:200 teacher-student ratio, or in a bleacher-type environment on a range someplace on Fort Benning. The current course is a 16-week, hands-on, hard-skill, field-oriented program of instruction. Eighty percent of the training is conducted in the field by the IOBC company commanders and platoon

trainers, with the platoon trainers being the cornerstones of this drill-based training program.

The 2d Training Battalion (IOBC) is a TDA battalion consisting of five companies; each company has five platoons. During a training cycle, a company is assigned 180 to 200 newly commissioned Infantry officers to train. The company commander, an Infantry major, is expected to set the leadership tone and conduct part of the training. More important, to ensure that high standards are attained and maintained, he spends the bulk of his time supervising the five platoon trainers and the ten NCOs (two per platoon) who actually conduct most of the training. In his 18 months of company command, he will train more than 600 newly commissioned Infantry officers for the Active Army, Army Reserve, and Army National Guard.

PLATOON TRAINER

A platoon trainer is an Infantry captain who trains and branch certifies approximately 40 lieutenants per cycle, or about 120 per year. He conducts more than 80 percent of the training for these lieutenants, the bulk of which is in the field, oriented on basic combat skills and tactics from fire team through platoon level.

The 16-week course of instruction in-

cludes six different field training exercises. (Only about nine days of the course are nontraining days, although we are looking at ways to further reduce week-end training.) The exercises begin with individual and crew-served weapons, individual skills, and movement techniques, and graduate through team, squad, platoon, and company operations. The platoon trainer must be an expert in all of these. He must have a grasp of the full range of weapons, drills, and tactics that platoon leaders might use in any of a multitude of missions or situations.

The student officers are introduced to a field environment during the second and third weeks of the course when they take part in numerous day and night navigational exercises and individual and fire team movements. These are followed by a series of practical certifications, qualifications, or familiarizations with Infantry platoon weapons. During the sixth and seventh weeks of the program, the training is devoted to NBC, communications, and indirect fire.

At the course's midpoint, the student officers themselves begin to feel the weight of their leadership responsibilities. The tactical leadership course, which consists of a series of 20 drills conducted over a period of seven days, gives each officer an opportunity to conduct tactical training in front of his peers. Given a tactical situation, a student officer instructs a

group of his peers in a combat-type drill, rehearses them on the drill, and finally executes the drill with that same group. Each student officer receives immediate feedback on his performance. During these seven days, a lieutenant is taught how to train, lead and fight, and how to build a cohesive team.

Up to this point a platoon trainer's role is primarily that of instructor. For the remainder of the course he serves as a mentor to his students. The four remaining field exercises are designed to train and challenge each Infantry lieutenant in offensive and defensive operations from squad to platoon level. Each is exposed to various situations and terrain, including urban, and operates as light infantry, air assault, infantry, and mechanized infantry. The exercises include a doctrinal overview, tactical exercises without troops, terrain walks, and some free-play.

The platoon trainer's job is to stimulate each lieutenant's tactical thought process, a job made more challenging because of the great differences in the students' experience and military knowledge. (Infantry officers are commissioned from more than 370 different institutions and programs including the U.S. Military Academy, the Active Army officer candidate school (OCS) program, several state National Guard OCS programs, and a wide range of Reserve Officers' Training Corps (ROTC) programs. The ROTC programs, while similar in many respects, vary from school to school.) Although the students start from these different points, it is the job of the platoon trainers to see that when they graduate the students all have the competence and the confidence to take charge.

It should come as no great surprise to anyone that the Infantry School emphasizes physical fitness in its IOBC program, and this is another aspect of leadership development in which the company commander and the platoon trainers are deeply involved. The recent emphasis on having Infantry lieutenants attend Ranger School has helped to focus and intensify the physical training program. (All Active Duty lieutenants completing IOBC are given a chance to attend the Ranger School before leaving Fort Benning.) Thus, the PT goal in IOBC is the same as the PT requirement for entering Ranger School. In



short, IOBC students get in shape, and stay that way.

In addition to intensive training, the course also offers some fun and relaxation. For example, company commanders, trainers, and their wives spend many duty and nonduty hours conducting a wide variety of social activities. These activities are designed to afford the student officers and their wives an opportunity to gain an understanding and appreciation for the Army's customs, courtesies, and traditions. We believe these activities enable the young wives to be much more at ease in the Army environment.

It is obvious, then, that IOBC company commanders and trainers are busy men. In fact, the intensity of effort, especially training, equals or exceeds that of any TOE battalion I have ever seen. For the Infantry captain, a tour as a platoon trainer is an excellent springboard for serving as a company commander, or a battalion S-3 or XO, or a brigade S-3. For the Infantry major, an IOBC company offers command in a dynamic, challenging training and leadership environment and is a wonderful opportunity to have a positive effect on the lives of some of our best young men. In my view, there are few positions in the Army that better prepare a major for battalion command.

Together, an IOBC company commander and his platoon trainers are responsible for developing combat Infantry platoon leaders who are tactically, technically, and personally competent; professional in appearance and behavior; physically fit; and confident of their abilities. By the very nature of their duties and re-

sponsibilities, and of their close relationship with young and impressionable officers, their influence is felt throughout the Total Army. In addition, these men are the true groundbreakers in the Army's new mentoring concept of training and development.

A captain who wants the challenge of learning while he develops newly commissioned Infantry officers may be a good candidate for the job of platoon trainer. (He must be an IOAC graduate competitive in his year group and must have commanded a company and preferably attended Ranger School.)

An Infantry major who is seeking the challenge of leading, training, and developing young officers; who wants to stay physically fit and keep abreast of new concepts of training doctrine; and who relishes the joy of training and leading may be a good candidate for the job of IOBC company commander. (He must be a graduate of a staff college.)

Any officer who is interested and meets these qualifications should give us a call. If he is accepted, I can assure him it will be one of the most challenging and rewarding jobs he will ever have.



Colonel Frederick Peters is commander of The School Brigade, U.S. Army Infantry School, at Fort Benning. He previously served in several staff assignments in the Department of the Army. He was a rifle company commander with the 1st Cavalry Division in Vietnam.

Leadership Abrams Style

MAJOR GENERAL ALBERT H. SMITH, JR.
United States Army Retired

In the closing months of 1969, following President Richard Nixon's summer visit to Saigon and to our armed forces then fighting in southeast Asia, decisions were made in Washington to start bringing U.S. troops home and to begin turning the war over to the South Vietnamese military forces.

During 1969, U.S. and South Vietnamese forces had been highly successful in operations conducted in all parts of South Vietnam. It seemed to those engaged in the fighting that the war was being won. With the news of the pending U.S. withdrawal, however, the high morale that had characterized U.S. forces until that time was noticeably dampened. No soldier looks forward to a hard fight when rotation is in the offing.

The commander of the United States Military Assistance Command, Vietnam (COMUSMACV), General Creighton Abrams, recognized that there would be difficult times ahead for the Army's leaders, and especially for those commanding companies, batteries, troops, and detachments engaged in combat operations. He also felt there would be similar problems among troops assigned to headquarters and support units. Not as productively busy as when the war was being fought, they too might find time to get into trouble. He knew that the desire to get home would be universal among all of our soldiers then in South Vietnam.

General Abrams wanted to meet with every commander down through the company level to reemphasize the fundamental principles of leadership that would assist, encourage, and reassure them as they coped with the difficult

times ahead. But that was physically impossible.

General Abrams, therefore, decided to put his message in a short letter, a copy of which would be sent to every U.S. commander in South Vietnam. He made it clear at the time that he did not want intermediate commanders changing his words.

After looking at and editing several draft letters, General Abrams was finally satisfied, and his approved letter, dated 20 January 1970, was reproduced and distributed.

The effort made to get the letter out did not stop with its distribution from General Abrams' headquarters. Special measures were taken, including spot checks in all major units, to ensure that every U.S. company-level commander had received his personal copy. Thereafter, the chain of command, from MACV down, took appropriate action to see that the guidance in the letter was understood and followed.

Here is that letter:

Leadership demands our constant attention, especially at the small unit level. It is here that a leader can influence most decisively and directly the conduct, performance, and welfare of his men.

Today's serviceman is the best educated, most intelligent, and most independent who ever served this country. He shows the same dedication and willingness to bear hardship and make sacrifices as his predecessors, but he wants to be recognized as an individual and to know "the reason why." Today's leader must take these traits into consideration.

This does not mean that there can be any degradation of standards. The leader must insist upon a discipline that will guarantee mission performance under trying conditions. He must deal with infractions promptly, fairly, and firmly.

Between the higher levels where decisions are made and the lower levels where they are carried out, the word doesn't always get through. There is often a block at the junior officer-NCO level which prevents the downward communication of requirements and the upward communication of reactions and ideas. Some leaders feel that explanations are unnecessary and that complaints reflect adversely upon their own leadership abilities. The same chain of command which passes orders down to the men must also pass their reactions up to the commander.

To compensate for this, some commanders use an "open door" policy; they will talk with anyone who comes in. But some men hesitate to penetrate the real or imagined obstacles between themselves and their commander. The "open door" works best when it swings both ways. A man must feel that he can frankly present complaints and ideas to his commander. On the other hand, the commander must get out and talk to his men, get them to talk to him, and find out what is going on. The result of this two-way contact will be mutual respect and mutual trust.

Another approach is the "open forum," a recent example of which is the junior officer council. This is an excellent means of improving understanding, but it must be kept under close command control and

supervision. The "open forum" cannot be allowed to become an organized protest session; commanders must guard especially against the outsider who would use this as a device for mass agitation.

Men in combat or hard at work have little time to reflect on their problems, real or imagined, because they are too busy. But when the tempo of fighting and working decreases, they have time to reflect. Little things are magnified. Rumors start. Tensions mount. Requirements come to be regarded as intrusions on individual rights.

... average American serviceman will believe what his leaders tell him as long as they do tell him. He must be told the reason for promotions, rewards, and punishments. He must be told what is expected of him and what he can expect from his leaders. The leader must take an

active role in explaining his actions and his plans. He must get the word to his men and forestall rumors which inevitably arise when there is no explanation.

Our servicemen have met the test, and they will continue to do so in the future. They will do their job even better and with less friction when complete and mutual trust exists between them and their leaders.

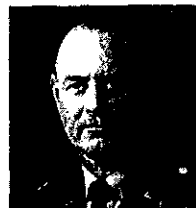
The mission of every leader is to get the job done, to get the word out, and to treat every man justly and with a full appreciation of his individuality.

Having had the good fortune to work for General Abrams in 1966 when he was Vice Chief of Staff of the Army and again in 1968 when he was COMUSMACV, I was able to observe his military char-

acter and leadership under a wide variety of conditions.

General Abrams was eminently fit for the responsibilities and the loneliness of high command positions, intellectually as well as psychologically. He was professionally competent in the highest degree and was willing to expend the effort required to command.

He will take his place in our military history as a great and good man — a leader for all seasons.



Major General Albert H. Smith, Jr., U.S. Army, retired, was J-1, MACV, from July 1969 to March 1970. He also served in Vietnam with the 1st Infantry Division as assistant division commander and acting division commander. He is now Honorary Colonel of the 16th Infantry Regiment.

Combat Motivation

MAJOR ROBERT L. MAGINNIS

Lieutenant Eli L. Whitely was a platoon leader in the 3d Infantry Division in World War II. In December 1944 he was leading his platoon in savage house-to-house fighting through the fortress town of Sigolsheim, France. When his platoon came under intense mortar and machinegun fire, he responded by charging into a building alone and killing two enemy soldiers. Then he stormed into a second building, capturing eleven and killing two more, and into a third building, killing five and forcing twelve to surrender. These actions earned him the Medal of Honor.

When asked why he did these things, he said simply, "My motivation was to keep alive." It would appear, however, that there was more to it than that; in fact, he risked losing the very life he desperately wanted to preserve. (After all, his was not exactly a safe course of action.)

Understanding the actions of soldiers

in combat is not a simple matter, because combat effectiveness appears to be more than the sum of its parts. We therefore need a holistic approach to understanding the subject — looking at the parts in relation to the whole. One such approach is to examine the interaction of three critical aspects of combat effectiveness — the battlefield itself, the technology we use on that battlefield, and the motivation of the soldiers fighting there.

Although Lieutenant Whitely's World War II battlefield was demanding, it pales in comparison with the one we can expect in the future. That battlefield will depend on initiative, depth, agility, and synchronization. Operations on it will be rapid, unpredictable, and violent. It will be characterized by significant dispersion, confusion, uncertainty, and unprecedented, discontinuous, rapid change. Past techniques that were based upon drill, rote, and continuous supervision

will become obsolete, and the focus of decision and control will shift downward toward the squad and the platoon. It is at these levels that future wars will be won or lost.

As for technology, the nature of the future battle will be complicated by the rate at which technology changes. This evolution in deployment methods, associated hardware, and organization will continue to be unprecedented.

The qualitative superiority these innovative systems may provide cannot ensure victory in battle, however. They will be only as good as the soldiers who use them, and soldier performance is difficult to measure.

The problem is that neither the battlefield nor the technology we will use on it can be understood completely at any given time. This leaves us with the third aspect — combat motivation — as our best chance to influence future perfor-

mance. A proper understanding of combat motivation will allow us to anticipate the actions of our soldiers and to increase their effectiveness on the future battlefield.

Why do soldiers fight?

Several studies conducted in the past reveal a variety of reasons, and these findings provide a reference point for today's leaders to use in trying to understand how they can influence tomorrow's soldiers.

After the Spanish Civil War, 300 of the Americans who had volunteered for service in the Abraham Lincoln Brigade participated in a study entitled "Fear in Battle." These volunteers indicated that good leadership was what motivated them. They said that good leaders provided frequent instructions (especially in tight situations), were admired and respected by the men, were experienced, and saw that the soldiers were provided with food, shelter, and other amenities. Most of the men agreed that "knowing the morale of your outfit is high" makes better soldiers.

The soldiers also indicated that they were better fighters because of their fear that if they showed weakness they would endanger the lives of their friends. This was especially true when they were under fire. The study concluded that proper motivation is important in any learning process and that fear is a strong motive if it is working on the right side.

Later, after World War II, many combat veterans, when asked what was most important in keeping them going, named ending the task, solidarity with the group, thoughts of home, and a sense of duty and self-respect. The researcher concluded that the informal group served two functions in combat: It set and enforced group standards, and it supported and sustained the soldier in stressful situations he otherwise might not have been able to withstand.

Vietnam provided similar results. One young soldier said, "We fight for each other. We're really tight here. Nobody else cares for us." In his Vietnam biography *The Killing Zone*, Frederick Downs said, "My job as platoon leader was to control the spectrum of emotions, to guide the men to survival." He also said that "the company commander could

command his company more effectively because he got to know the men and their weaknesses and strengths." This supports Colonel Ardant du Picq's assertion that "when soldiers know they have support they are better fighters."

Various attempts have been made to reduce these ideas on combat motivation to some sort of system that commanders and leaders might use to predict and somehow improve their soldiers' combat effectiveness. In fact, the Center for Army Leadership has adopted a combat motivation model for use in the Army's officer advanced courses.

The model consists of four parts — the soldier, his immediate task, his desired outcome, and the other people around him (his leaders, peers, and subordinates). In addition, the model includes three forces that affect these four parts — the influence of the others on the soldier, the value the soldier places on a particular outcome, and his confidence in his own ability to perform the task to the required standard (see sketch).

It may be useful to Infantry leaders to examine these interacting parts and analyze the three forces that influence them. For purposes of illustration, we will use Lieutenant Whitely's World War II situation.

The first part, the soldier, is more than just the man — it is the *whole* man, his personality and temperament, his training experiences, and more. To fully understand Whitely's actions on that fateful day, we would have to have some understanding of these things.

The second part, the soldier's immediate task, was, in Whitely's case, to halt the enemy's resistance. His minimum effective performance in that case had to include actions that would maintain positive control of the men and a decisiveness under fire that would result in the suppression of the hostile fire without undue risk to the platoon.

As for the soldier's desired outcome, Whitely said he was motivated by a desire to survive, but his actions did not appear to support this outcome. It is more likely that he connected his survival to the rapid termination of the task. Or his desired outcome may have been saving the lives of his men and keeping their respect and trust.

The fourth part of the combat motivation model is the role played by the others around a soldier — leaders, peers, and subordinates. Whitely may have risked his life because that is what infantry platoon leaders are supposed to do. Maybe he just did not want to let his commander and his soldiers down.

The first influencing force on a soldier also comes from these other people. They may persuade him to perform the required task or convince him that his performance (to standard) will lead to his desired outcome. In Whitely's situation, he had previously demonstrated his ability to clear buildings of enemy troops. It was not an unfamiliar situation. (He intuitively understood the connection between clearing the buildings and terminating the enemy's resistance.) Additionally, his previous exploits had established a precedent. His soldiers had grown accustomed to his initiative and decisiveness. Anything less would have been out of character for him. Whitely therefore placed himself into a complex relationship in which he was forced either to clear the buildings or to risk losing his credibility.

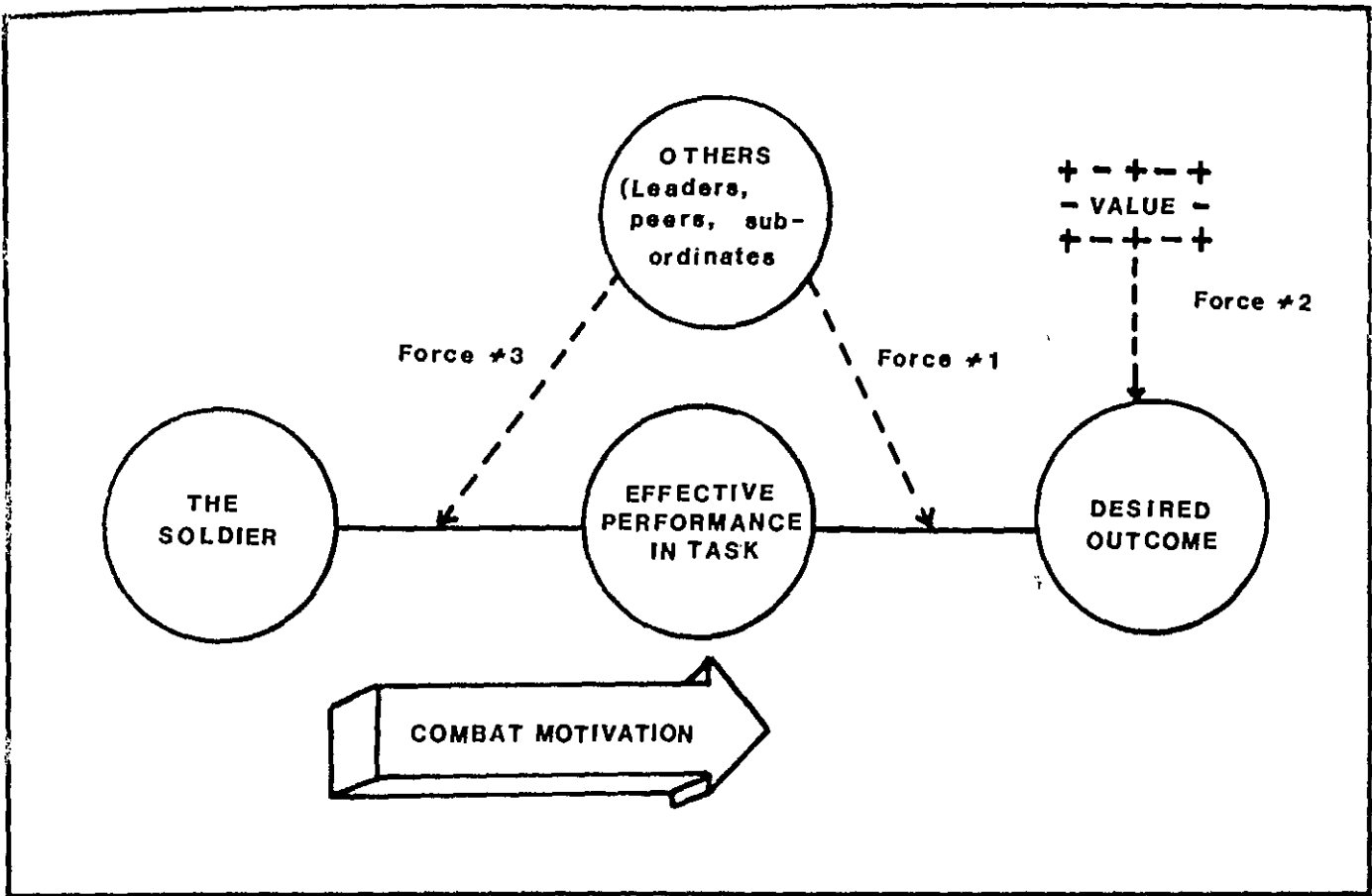
The second influence, the intrinsic value the soldier places on the desired outcome, is also strong. For Whitely this was the termination of the enemy's resistance. He understood from past experience that his combat prowess (his effective performance as an infantry platoon leader) would lead to the desired outcome. This influencing factor is essentially the result of all the pluses and minuses associated with personal actions and their connection to a valued outcome.

The third force, the soldier's confidence in his ability to perform his immediate task to standard, results from his past training experiences, encouragement from others, and his own assessment of the situation.

The combination of the four parts of the model and the three influencing forces explains why Whitely fought so hard.

But how can we take this model and the knowledge of motivation gleaned from earlier wars and apply them to our task of predicting and improving combat motivation among our soldiers today? There are several ways:

- We must take a new soldier and



Combat Motivation Model

equip him with high-quality training so that he will be confident in his abilities and his equipment. We must give him opportunities to act independently, to make decisions that support the accomplishment of his assigned tasks, and to become comfortable with taking the initiative.

- We must make sure this soldier understands what we expect of him. This begins with mundane matters and spills over to actions that lead to effective combat performance. We must not expect perfection at first but must encourage him as he learns to perform to our high standards.

- We must keep the soldier's attention focused on mission accomplishment, helping him to see that he can achieve his personal goals and the unit's goals at the same time and harmoniously. Persuading him to buy into the unit's goals is critical to this task.

- We must either influence the things he values or replace what he values with something we can influence. If he values time off, official recognition, or on-duty educational opportunities, then we must show him how these things are related to his performance and follow through by

delivering the desired outcome in exchange for his effective performance.

- We must understand how important trust in his leaders is to him. Soldiers will follow us if our integrity is above reproach, if we are technically competent, and if we consistently demonstrate that we take care of him. Building trust takes a long time but losing it often takes no time at all. The key is consistency. The trust and confidence we earn today will follow us into battle tomorrow.

- We must try to build small teams and keep them stabilized as long as possible. The longer soldiers have worked together and the better they know one another when they get to the battlefield, the better they will fight. This is an unwritten principle of the profession.

If we consistently try to do these things, our ability to motivate our soldiers in combat will be simpler. We must continue to earn the trust of a soldier, keep him informed, provide for his needs and comforts as best we can, and listen to him. We must also set the example by keeping our own morale high. A well-practiced voice of authority when in contact with an enemy force will get results

and maintain the soldier's confidence.

The success or failure of a small unit depends to a marked degree upon the leader and what he does. His job is to help the soldier anticipate, understand, and cope with danger and fear. The important thing is for a leader to control a soldier's fear and use it to advantage. A leader who understands why soldiers fight can capitalize on this understanding and motivate them to fight and win.

Maurice de Saxe said, "The human heart is the starting point in all matters pertaining to war." A proper understanding of motivation opens the door to a soldier's heart. Leaders who use their understanding to improve the combat effectiveness of their soldiers can bring excellence to the Army and victory to the battlefield.



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Productivity and Mission Accomplishment

CAPTAIN JOSEPH P. AVERY, *United States Air Force*

Having had some experience in the Army as well as in the Air Force, I believe the problems of management, leadership, and training are pretty much the same in both services. In fact, I got the idea for this article as a result of reading the excellent article by Captain Samuel K. Rock, Jr. — "Training New Lieutenants" — published in the November-December 1984 issue of *INFANTRY*. I was surprised at how well the particulars of his *training article* also applied to new lieutenants in the Air Force.

I recently completed an assignment as a missile maintenance officer with a Minuteman missile wing at Minot Air Force Base, North Dakota. I found that assignment particularly challenging, partly because of a work area of hundreds of square miles and partly because of the weather, which varied from nearly 100 degrees below zero to 100 degrees above. During extended periods of cold weather, cabin fever developed among the personnel, maintenance became difficult, and morale problems increased rapidly.

But as a former paratrooper in the 82d Airborne Division, I realize that these leadership and operational problems are quite similar to those that confront commanders in the Army's combat arms — accomplishing the mission, maintaining readiness and morale, and squeezing as much productivity as possible out of their subordinates.

No matter how harsh the environment, the first priority for any leader is to accomplish his mission or, to state it

another way, to avoid mission failure. And in peacetime or wartime, the causes of mission failure are many.

For example, a careful review of some marginally successful U.S. or joint military operations in Europe and North Africa during World War II reveals that mission failure or near failure could often be attributed to one or more of the following specific causes:

- Communications failure.
- Decision-making failure.
- Intelligence and information failure.
- Preparation and contingency failure.
- Insufficient training and discipline.
- Improper coordination.
- Equipment failure.
- Leadership failure.
- Individual failure.

During Operation TORCH in Northwest Africa, for example, a paratroop task force was enroute to Algeria, assuming that the French would not oppose the landings, when in fact the French decided to do just that. Unfortunately, the task force was not notified of the change because a shipboard radio operator had not been assigned the correct radio frequency to alert the planes as they flew over the Mediterranean. There are also other examples, of course — the military intelligence fiasco and radio communication failure during Operation MARKET-GARDEN, and the incident in which members of the airborne 504th Regimental Combat Team over Sicily were fired upon by their own ground troops and naval forces.

Air Force missile commanders and

Army infantry leaders today face some of these same problems because of faulty equipment, information that is not properly disseminated, and personnel who are injured because of inadequate training or discipline. These problems, in turn, can seriously affect a unit's productivity, and, thus, its ability to accomplish its mission.

Fortunately, there are certain steps that leaders and supervisors can take to achieve greater productivity and help overcome the problems that often lead to other failures. These steps involve greater emphasis in the areas of organizational communication, integration of tasks and activities, and personnel motivation.

Effective management and leadership techniques provide the foundation for organizational productivity. But what combination of procedures and personal characteristics *actually* makes a manager or a leader effective? Although I cannot identify a set of traits that *all* successful leaders possess, most highly successful leaders do seem to have in common the following six characteristics:

They respect all people. Successful leaders consistently demonstrate a genuine respect and admiration for *all* individuals, regardless of their particular jobs or ranks or social positions. Unlike some managers, they do not feel they are "lowering" themselves when they communicate with or praise their subordinates. They tend to view themselves as being on the same level, but with different or higher levels of responsibility.

Their basic attitude is, "We are all members of the same team, so let's work together to accomplish the mission."

They take pride in their work. Successful leaders perceive their work as representing *them* and reflecting their dedication to the job. As a result, they take considerable pride in their work and demand from their subordinates high quality products and performances.

They trust and develop their subordinates. Successful leaders believe that unless they demonstrate trust and confidence in their personnel, the productivity and effectiveness of their organization will never even near its peak, and they themselves will never receive the respect they need to lead effectively. They expect the temporary failure of new or inexperienced personnel, however, realizing that initial failure often toughens an individual, provides wisdom, and eventually improves his long-term productivity and worth. (History has proved that from the ashes of failure rise some of mankind's most outstanding achievements and triumphs.)

They hold people accountable and permit them to do their jobs. A leader's function is not to do everyone else's job but to make sure each person does his own job. Regardless of a leader's management position, unless he holds people accountable for their work, permits them to do it, deals with them on an adult-to-adult level, and disciplines them when they need it, he will find that gaining their respect and loyalty will be difficult, if not impossible.

They appreciate people. Successful leaders continually display a sincere appreciation for the daily productive efforts of others. They do not feel uncomfortable praising their subordinates when praise is appropriate. These successful leaders



show appreciation not only for a person's exceptional and special efforts, but also for his everyday contributions.

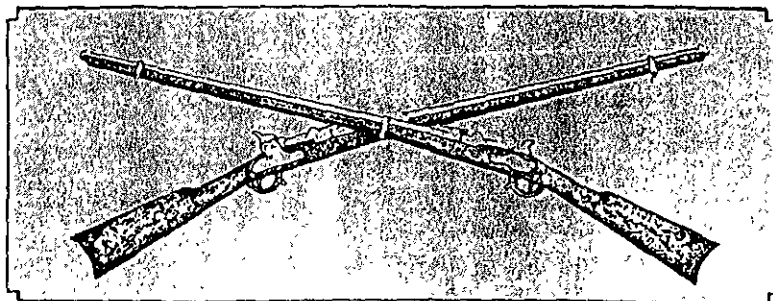
They know what is going on in their organizations. The best managers and leaders do not sit in their offices waiting for the world to come to *them*. They get out and see what is happening. By visiting work centers, communicating with people, and discovering both the problems and the promising areas, managers soon become more knowledgeable about their organizations. They also reap the added benefit of not having to hold as many meetings to get things done.

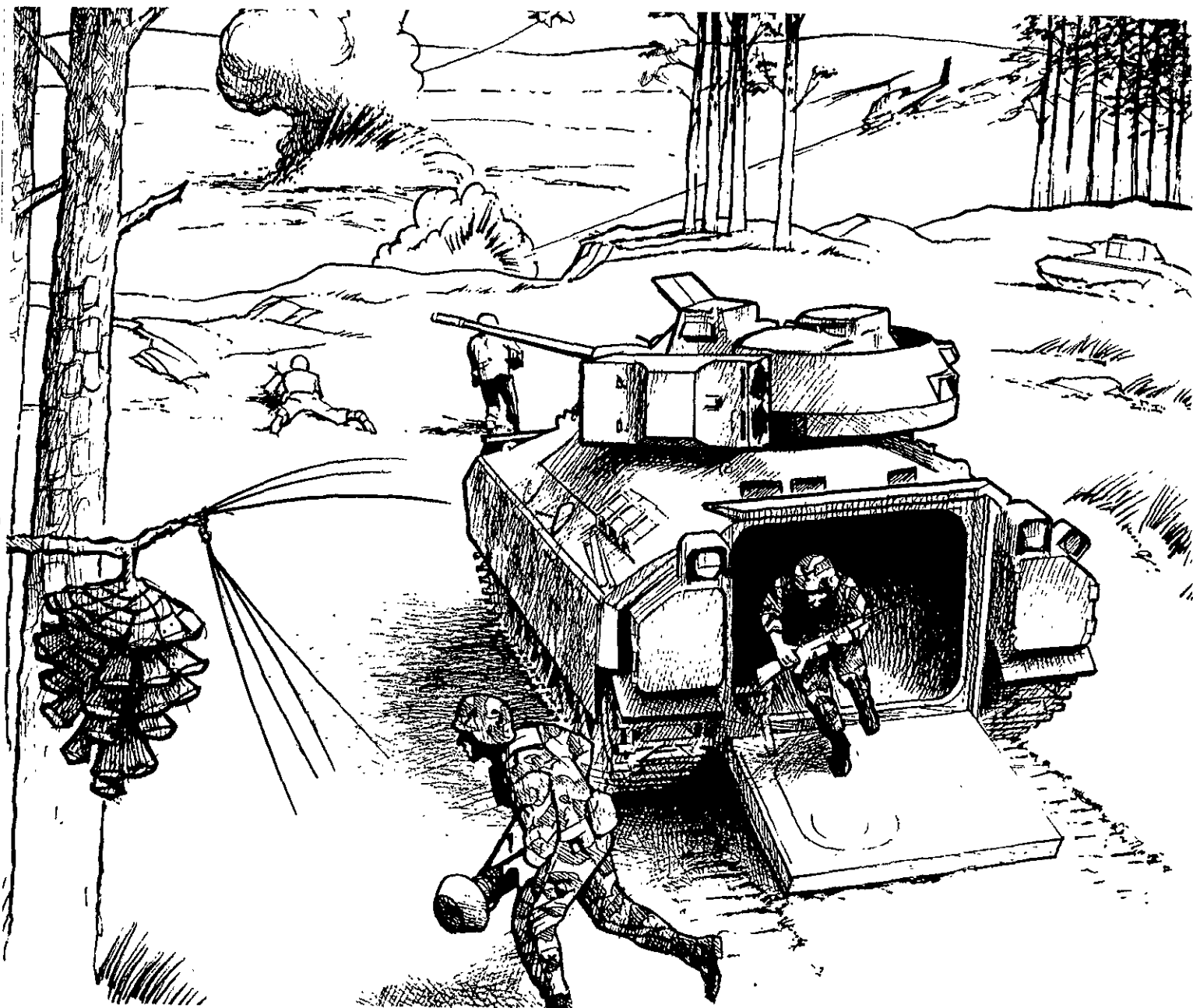
These six keys to productivity are not

the entire answer, of course, but these observations may serve to provoke the thoughts of both new and experienced Infantry officers and improve their effectiveness in their respective organizations. This improvement, in turn, should lead to more effective mission accomplishment.



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BRADLEY INFANTRY ON THE AIRLAND BATTLEFIELD

COLONEL CARL F. ERNST
MAJOR DAVID M. WHITE

These are exciting times for the infantry, for we are part of an Army that has recently made a commitment to change in three vital areas.

First, we have returned to a doctrine of maneuver warfare and have embodied this doctrine in a new FM 100-5, "Operations." As part of this new doctrinal orientation, we have returned to a study of the operational level of war, a concept we had neglected for many years. In addition, our AirLand Battle doctrine has reemphasized our need to work more close-

ly with our sister services and our allies. There has also been a new emphasis on the lessons of military history as well as a new appreciation for many of the classical military writers, such as Clausewitz, Sun Tzu, and Du Picq.

Second, we have reorganized our fighting units under the Army of Excellence (AOE) plan. Our combat divisions and maneuver battalions are now more streamlined, with a higher tooth-to-tail ratio and with more flexibility and depth. We have also added combat forces to our Army, especially light divi-

mons and Special Operations Forces (SOF).

Third, we have begun the greatest force modernization program in our history, a program that will take the Army into the 21st century outfitted with the best weapons and equipment in the world. The M1 tank, the M2 and M3 fighting vehicles, the Apache and Black Hawk helicopters, and the MLRS and Patriot weapon systems represent only a few of the many new systems we are now integrating into our Army.

Our heavy forces have been significantly affected by this combination of new doctrine, organization, and equipment. And while it will be many years before all of our tank and mechanized battalions have the new tanks and fighting vehicles, all of us must consider today how the combined arms team will operate on the AirLand battlefield.

From the infantryman's point of view, this means consideration of how mechanized infantry units equipped with the Bradley fighting vehicle will operate on that battlefield.

THE BRADLEY

The Bradley fighting vehicle (BFV) represents the most dramatic improvement in the infantry's combat capability since the introduction of the machinegun. For the first time in our history, the infantry has a true fighting vehicle. Its firepower, speed, and armor protection, when combined with its ability to carry infantrymen into battle, make it an extremely lethal fighting system. The BFV is not just an improved APC; it has caused a radical change in the way our mechanized infantry forces operate.

Despite its increased capabilities, the BFV has certain limitations that must be considered in its employment. It is not a light tank. Although it is quick and agile and has an impressive array of weapons, it does not have the armor protection that allows it to travel around the battlefield like a tank. Therefore, its crew must use covered and concealed routes when possible, and hull-down firing positions. The vehicle cannot be expected to move across open ground against an entrenched and prepared enemy if the enemy has good long-range antiarmor shots. The Bradley's survivability is provided by its proper employment to include careful positioning, clever use of the ground, and effective overwatch techniques. (See also "Fighting the IFV," by Captain Robert P. Sedar, *INFANTRY*, September-October 1981, pp. 34-37, and "Training Strategy for the IFV," by Lieutenant Colonel John D. Fuller, *INFANTRY*, September-October 1980, pp. 15-19.)

But it is the increase in vehicle capability and complexity that has led to fundamental changes in the way mechanized infantry does business. The BFV requires a fully trained three-man crew to properly fight the vehicle, yet at the same time it carries a rifle team whose primary role is to dismount and fight on the ground. The leadership of the Bradley squad must be balanced between the fighting vehicles and the dismounted rifle team.

Many of the old methods of command and control and the old roles of leaders must change to accommodate this new and powerful system. One of the major changes is that the basic level of tactics for Bradley infantry is the platoon. Below this

level Bradley squads execute drills, which are like the set plays called in the huddle of a football game. They allow the Bradley squad to react quickly and efficiently to the kinds of situation it can expect to encounter often on the battlefield. (See "Drills," by Major Royal A. Brown III and Captain Mark E. Crooks, *INFANTRY*, July-August 1985, pp. 35-38.)

PLATOON TACTICS

The Bradley platoon provides both the structure and the organizational flexibility to execute modern maneuver warfare. The platoon is equipped with four M2 Bradley fighting vehicles and organized with a platoon headquarters and three Bradley squads. The platoon leader with his headquarters and attached personnel are mounted in one BFV and the squads are mounted in the other three.

Each Bradley squad has one vehicle and nine Bradley infantrymen (11M). It is divided into a vehicle crew and a rifle team. A squad's leadership consists of a squad leader and an assistant squad leader. During mounted operations, the squad leader normally is part of the vehicle crew and acts as the vehicle commander while the assistant squad leader takes charge of the rifle team.

For hasty situations, where there is no time to plan, the rifle team always dismounts and is led on the ground by the squad leader. The assistant squad leader remains with the BFV. For deliberate situations, when adequate planning time is available, the placement of the squad leaders varies with the situation.

When organized for combat, the platoon realigns its leaders to facilitate the command and control function and to accommodate the control of the dismounted infantrymen. The key leaders are positioned to ensure that the critical vehicle commander positions are always filled with experienced and trained personnel. For example, the platoon leader is mounted in BFV #1, the platoon sergeant in BFV #4. The platoon master gunner, a new position in Bradley infantry units, and the assistant squad leader from BFV #4 (3d squad) assume control of the platoon leader's vehicle when he dismounts.

(Both the BFVs and the tanks in a task force use the same standardized numbering system to simplify command and control when they work together.)

The platoon's Bradleys fight in relation to its dismounted infantry elements. Thus, they can overwatch the dismounted rifle teams at ranges out to 2,000 meters, which lets the platoon leader use his infantry in restrictive terrain while employing the BFVs in more open, high-speed terrain.

The platoon moves and fights mounted whenever possible. When all of the platoon remains mounted, it fights as a single force under the control of the platoon leader. Rifle team members aid the crew in reloading the vehicle's weapons, man the firing port weapons, provide security, and remain oriented by looking out through the vision blocks.

When the tactical situation requires the platoon leader to dismount his platoon, he must make sure there is a complete crew (three men) in each Bradley so they can provide a base of fire and fight on the move if they must. In most cases, the platoon

leader will be with the dismounted element, because the dismounted action will usually be the most critical. The platoon sergeant will remain with the base of fire element, which normally consists of the Bradleys, although the platoon leader will exercise overall control of both elements.

In deliberate situations, where the platoon leader has an opportunity to analyze the factors of METT-T and to assess the effects of reorganization, and enough time to inform all platoon members of a temporary change in command relationships, he may choose to deviate from the normal hasty dismount command relationships.

For example, in offensive operations:

- If a mounted maneuver using BFVs is planned in conjunction with a dismounted assault, the platoon leader may choose to stay with the vehicles while the platoon sergeant maneuvers or infiltrates the dismount element to a position of advantage where they can set up a base of fire to allow the BFVs to move against the enemy force.

- If during night dismounted operations a link-up with the BFVs is planned to occur during daylight or when support from the BFVs weapons will be limited, all of the principal leaders may dismount.

- If in other operations the company commander's intent dictates rapid mounted movement, the platoon leader may choose to dismount only small security teams under their own leaders and try to bypass any resistance, even though there may be some risk.

Generally, in the defense, a platoon leader will have more opportunities for deliberate action, and he can adjust his mounted or dismounted organization more often.

Since defensive operations involve dismount operations that are usually position oriented, though, the maneuver element in the defense is most likely to be the BFV element. When this is the case, the platoon leader may choose to be with the vehicles to control the vehicle fight, leaving the platoon sergeant to control the dismounted elements. In addition, selected BFVs may be given an additional crew member each to load the TOW launcher if a heavy vehicle fight or long-range antiarmor fires are planned.

Regardless of the organizational method he uses, a platoon leader retains overall control of his platoon. An exception to this rule is a case in which the dismounted elements from several platoons are placed under the direct control of either the company commander or the company executive officer.

COMPANY TACTICS

The platoons themselves will normally operate as part of a company or company team. In a company team organization, the mechanized infantry platoons in the offense will operate with one or more armor platoons, and the company team commander will specify the combination of tank and infantry units he wants to use during any particular operation. For example, in a deliberate attack, he may direct that the tanks lead across the line of departure. If the terrain becomes restrictive, he will dismount his infantry to clear the restricted area, and the tanks will follow. Once beyond the restricted area,

the infantry will remount and the tanks will again lead to the next dismount point.

For an assault on an objective, the dismounted infantry will move forward along covered and concealed routes to support a tank assault with close overwatch fires. The BFVs, meanwhile, will support the assault from long overwatch positions.

The BFV, because of its turret weapons, offers a number of defensive employment options not previously available to a combined arms team. These weapons allow the vehicle to fight against the enemy on its own, while the dismounted infantry elements fight the enemy in restricted terrain.

In the defense, Bradley units have four basic employment options: BFVs and dismounted infantry elements can be on the same battle position covering the same avenue of approach; on the same position covering different avenues of approach; on different battle positions covering the same avenue of approach; or consolidated at company team level.

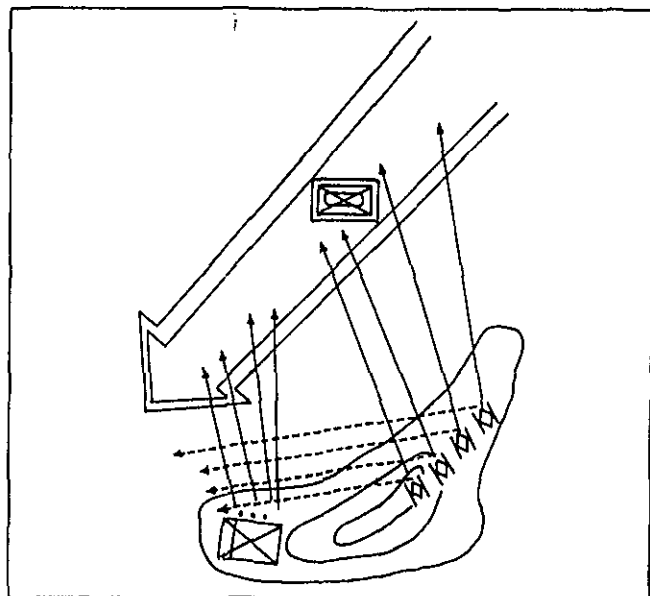


Figure 1. Same battle position, same avenue of approach.

The first of these options — same position, same avenue of approach — which is the usual one for M113 units, covers a wide range of tactical situations and provides the best security for the vehicles (Figure 1). If the battle position covers a mounted avenue of approach, the BFVs are positioned to cover the approach with fire. The dismounted infantry elements are placed so that they can cover any deadspace that might allow the enemy to infiltrate, or they are dug in around the vehicles for security.

If the battle position covers a dismounted avenue of approach, the infantry is positioned to cover that avenue and the BFVs are dug in (when possible) and used to supplement the defensive fires. This is not necessarily the ideal way to use a BFV, but it may be the only way if a unit is directed to defend a piece of restricted terrain.

In either case, the dismounted infantry elements are used to emplace obstacles and conduct reconnaissance and surveillance operations, including establishing observation posts, patrolling, and conducting counter-reconnaissance missions.

The second option — same battle position, different avenues

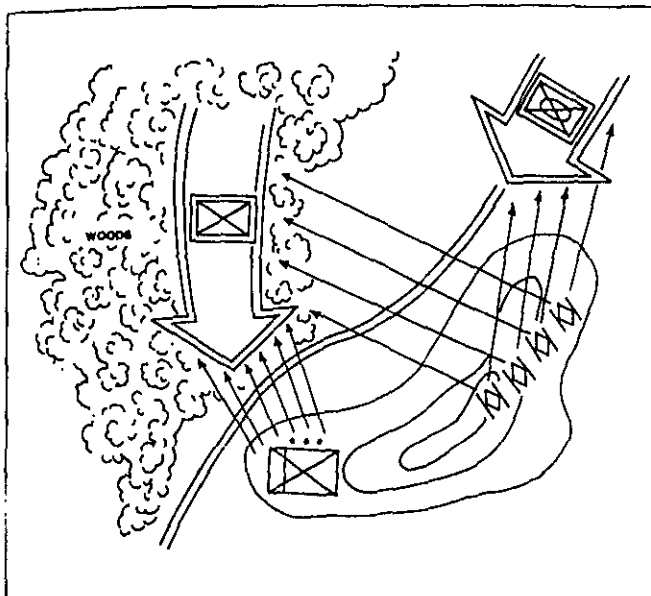


Figure 2. Same battle position, different avenues of approach.

of approach — is made possible by the two distinct elements into which Bradley-equipped infantry units can separate: dismounted elements and fighting vehicles (Figure 2).

In these situations, the dismounted elements occupy areas within the battle positions that offer the best cover and concealment and fields of fire to block the dismounted avenue of approach to the position. In the meantime, the BFVs cover a different, normally mounted avenue of approach, but they must be able to move rapidly to supplementary positions to provide supporting fires to the dismounted element.

In some defensive situations, a battle position will not have the type of terrain that allows the two elements an opportunity to use their distinct weapon systems to the fullest. However, the speed, agility, and long-range fires of the BFV allow the unit the third option — to cover the same avenue of approach as the dismounted elements but from a different location (Figure 3). Thus, a platoon leader may be directed to employ his BFVs on a battle position different from that of his dis-

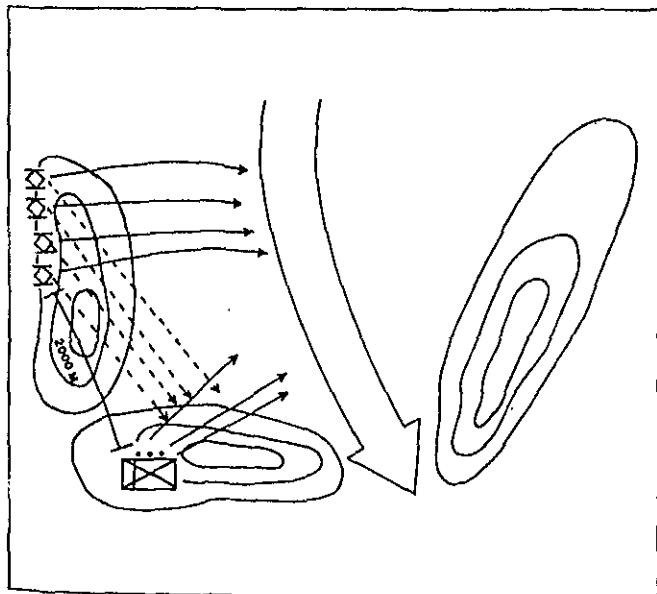


Figure 3. Different battle positions, same avenue of approach.

mounted infantry. This means that the dismounted infantry and BFVs fight separated but in relation to one another.

Fighting in relation to one another simply means that the BFVs can give supporting fires to the dismounted elements from their primary or supplementary positions and that both elements are positioned to engage the enemy forces on the same avenue of approach but at different ranges. A maximum distance of separation of 2,000 meters allows the fires of the 25mm gun on the Bradley to reach and overlap the positions occupied by the dismounted teams.

A platoon leader may choose to locate with either element but will probably most often be with the BFVs. This will permit him to directly supervise their employment and to make sure they shift their fires to cover the dismounted infantry at the appropriate time.

As for the fourth option — consolidation at company team level — in certain situations, the vehicles and the dismounted elements may not be able to fight in relation to each other. Accordingly, the team commander may consolidate his dismounted elements in one location under the control of his ex-

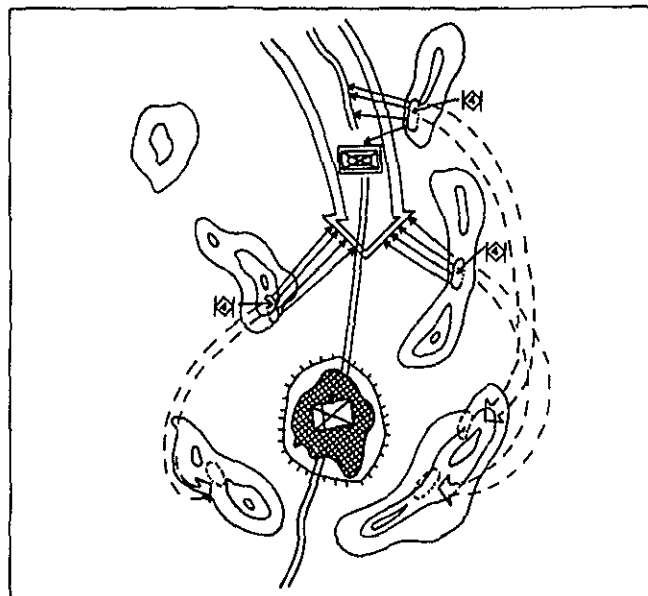
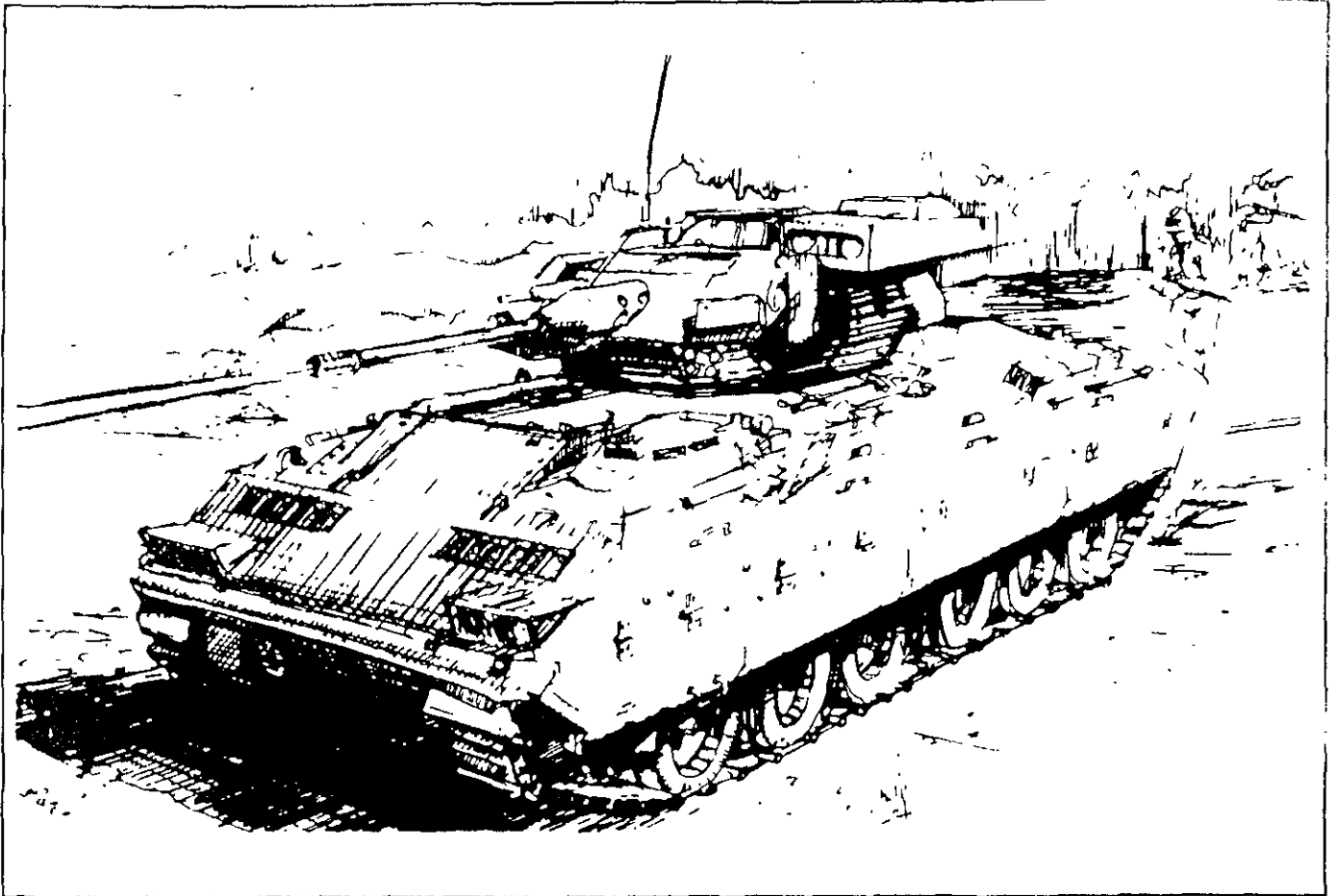


Figure 4. Company team defense option.

ecutive officer, while he assumes control of the BFVs in a separate location. This could occur, for example, when a large number of dismounted troops are required to hold a position such as a strongpoint; or when the primary position for the dismounted elements does not give the BFVs adequate fields of fire; or when the dismounted elements have to occupy heavily wooded or rugged terrain that the BFVs cannot traverse; or when both a mounted and a dismounted avenue of approach have to be defended from the same battle position (Figure 4).

But even when a company's dismounted infantry elements are consolidated, the dismounted infantry and the BFVs may not be able to support each other initially. Plans should then be made to take advantage of the speed of the vehicles to reposition them as soon as possible to support the dismounted infantry.

In addition, during periods of limited visibility, a company team commander may modify his plans to provide additional



security for his fighting vehicle elements. He can do this by moving a rifle team to each fighting vehicle element's position or by consolidating the platoons on a single battle position.

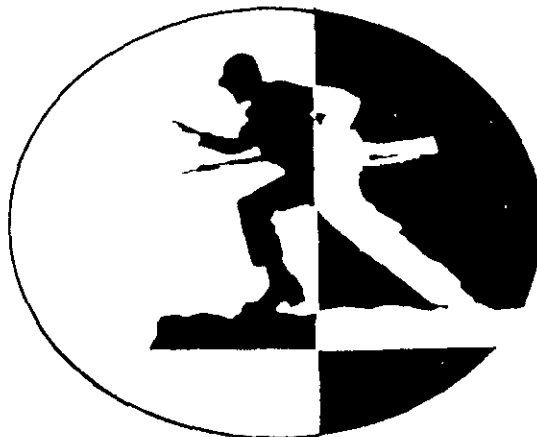
SUMMARY

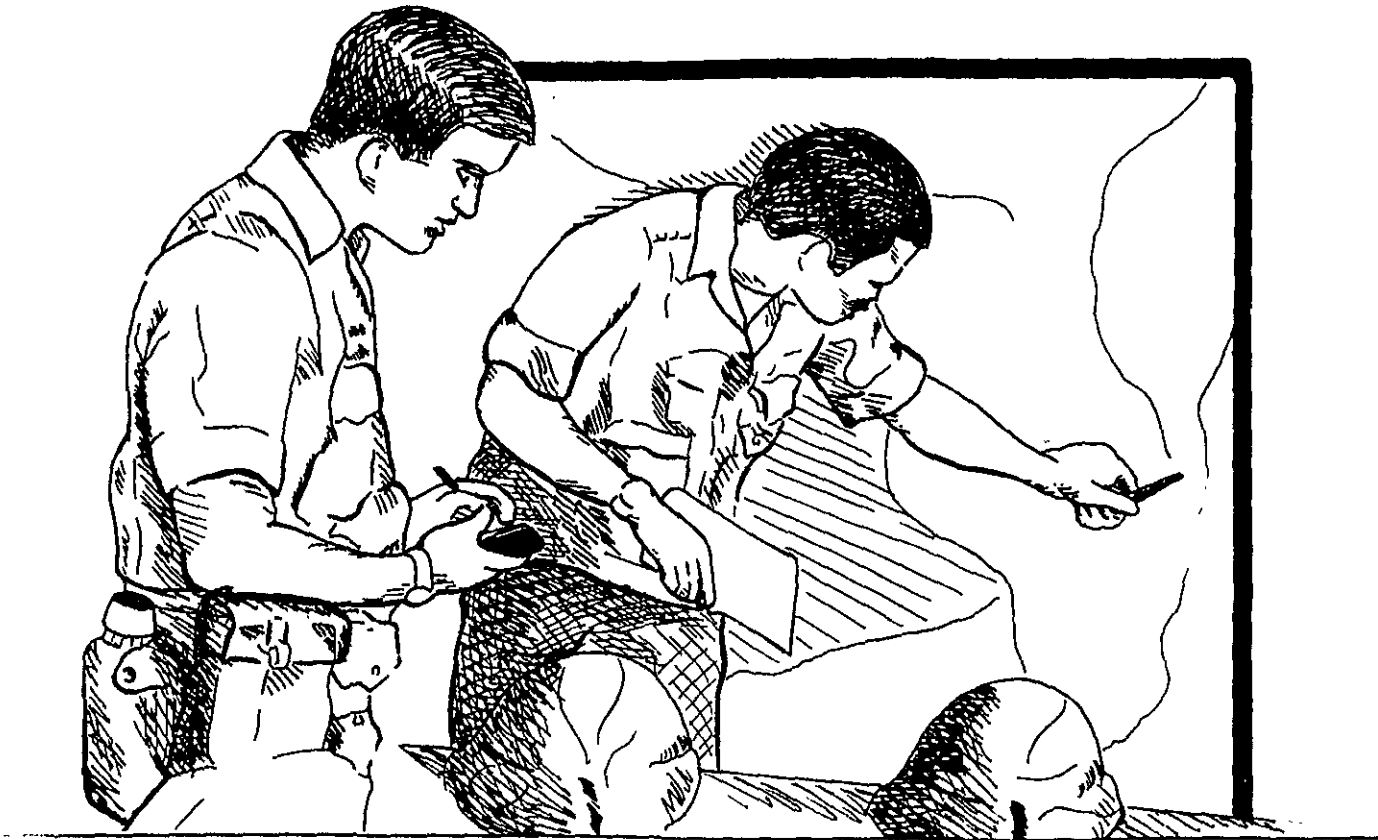
Modern maneuver warfare places a premium on quick-thinking leadership, aggressively executed tactics, and fast and powerful equipment. Equipment alone, however, will not bring us victory on the battlefield. Our soldiers must be well trained in tactics and gunnery; our officers and NCOs must be well trained in those leadership skills that allow an idea to be transformed into a plan and that plan to be professionally executed.

Above all, maneuver warfare for mechanized units means understanding how to operate with other elements of the combined arms team. In the end, it will be this combined team rather than its individual components that will win on the battlefield.

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COMMAND AND CONTROL

LIEUTENANT COLONEL JOEL E. WILLIAMSON

Along with the recently introduced AirLand Battle doctrine, the arrival of the Bradley fighting vehicle and the Abrams tank, with their improved firepower and mobility, have spearheaded a resurgence of maneuver warfare in the United States Army. But these new systems in the Bradley and Abrams battalions can defeat a mechanized enemy threat only if we have a timely and aggressive system of command and control at all levels from battalion down to squad. The one element that

coordinates the command and control effort in the battalion, besides providing the built-in organizational flexibility that is so necessary to counter any enemy on the battlefield, is the tactical operations center (TOC).

Although the TOC organization in the J-series battalions is essentially the same as that of the old H-series organization, the command and control requirements have increased. While the AirLand Battle doctrine is catching up (the revised FM 71-2 will be published next year), the National Training Center has filled the void by providing a proving ground on which J-series battalions can completely exercise their operational systems.

The guidelines I offer here concerning the operational

aspects of a command group and a TOC are based upon my experience with one Bradley battalion during unit training at home station and during a rotation at the National Training Center (NTC).

In actuality, the TOC is just one of three command and control facilities that a heavy task force uses, the other two being the tactical command post (TAC CP), which fights the battle, and the administrative logistics operations center (ALOC), which supports the battle.

The command group in the TAC CP usually consists of the battalion commander and the staff members he feels he needs to help him fight the battle. In my battalion's case, these were usually the fire support officer (FSO), the air liaison officer (ALO), and sometimes the S-2, depending upon the mission. All three rode in the battalion commander's Bradley, which was equipped with four AN/VRC-46 radios.

The ALO rode in the Bradley because his usual vehicle — a jeep — was too vulnerable to enemy fire and it could not keep up with the tracks during cross-country movement. In the Bradley, the ALO used his back-up UHF/VHF man-pack

	ASSEMBLY → LD	LD → PL RED	PL RED → PL BLUE	PL BLUE → TUNA
ARTY PRIORITY OF FIRES	SCTS	TMA	D	D, TMC
4.2 PRIORITY OF FIRES	SCTS			
4.2 LOCATIONS	GRID	NEW GRID	NEW GRID	NEW GRID
CAS		GRID LOC OF TGT	GRID LOC OF TGT	GRID LOC OF TGT
PREPS				10 MIN ON OBJ TUNA
PRIORITY TQTS		1. GRID	1. GRID 2. GRID	

Figure 1. Fire Support Plan Matrix.

radio for communications. His jeep with its mounted radio was left with the TOC as a back-up system for controlling close air support (CAS).

The FSO often occupied the gunner's seat in the turret. This is consistent with the doctrine laid out in FM 71-2J and FC 21-26, but it is far from an ideal solution. When the FSO and the battalion commander are co-located, they can most efficiently coordinate the battalion fires, but they can only partially control the execution of the fires. This is so because the company fire support teams (FISTs) and forward observers (FOs) send their calls for fire digitally, using the DMD, straight to the supporting artillery battalion, bypassing the battalion fire support element (FSE). The calls are handled on a first-come, first-served basis. The fire support element at the TOC gets feedback through messages on his variable format message entry device (VFMED) from the supporting artillery battalion's fire direction center (FDC) but only after the messages have been processed by the FDC. Thus, unless the company FISTs and FOs use the voice back-up system, both the FSO and the battalion commander have trouble staying abreast of the indirect fire battle.

The use of a fire support matrix that lays out the battalion commander's scheme of fires is an effective technique for solving this problem. (This is currently being taught as a doctrinal technique at the Artillery School.) Figure 1 is an example of an offensive fire support plan matrix developed jointly by the FSO, the S-3, and the TF commander. Not only does it establish who has priority of fire during each phase, it also integrates CAS and priorities of movement for the 4.2-inch mortar platoon. Defensive fires can be planned in the same manner. The use of such a matrix also reinforces the doctrinal concept that calls for the centralized planning of fires and their decentralized execution.

With the advent of the FIST DMD in 1987, this problem should be rectified, because this device will enable the FSO to monitor and selectively override all task force FIST DMD transmissions. The important point, though, is that a battalion commander and his FSO must work closely before and during a battle to ensure timely and accurate fire support.

One of my previous battalion commanders also included the S-2 as a member of the TAC CP on some missions when he felt that early accurate intelligence from the scouts and ground support radars were a key to the success of the mission. This occurred most often in the defense and movements to contact. The S-2 rode in the back of the TF commander's vehicle and monitored the net over which the scout platoon leader passed periodic situation reports. The S-2 then relayed key critical information to the TF commander over the intercom.

This technique provides critical information to the commander much sooner than the TOC can by relaying reports. It also strengthens the command and control process, because together the TF commander and the S-2 can analyze enemy actions as they are reported.

The other key member of the command group who is usually a member of the TAC CP is the S-3, but an alternative is for the TF commander to use the split command concept. This means that instead of locating the S-3 in the TAC CP, the commander positions him elsewhere to command and control another critical sector or zone of the battle. This is a grey area in our doctrine on which little has been written. (One of my previous TF commanders chose to use a split command during all missions at the NTC.)

The effectiveness of this technique is dependent upon the relationship between the TF commander and the S-3. The commander must feel that he can trust the abilities and the tactical judgement of his S-3, and he must be able to communicate his intent clearly to the S-3. Additionally, subordinate commanders must understand the concept and readily accept guidance from either the S-3 or the TF commander.

The split command concept is especially effective in a Bradley battalion, with its increase in the span of control from three to five maneuver units. It allows the commander to go to the focal point of the battle while the S-3 is at the second most critical point. With this increased view of the battlefield, decisions can be made faster and can thus be more timely.

One drawback to this technique is that, in the heat of battle, decisions made by one member of the split command on the ground may never be communicated to the other. But that is

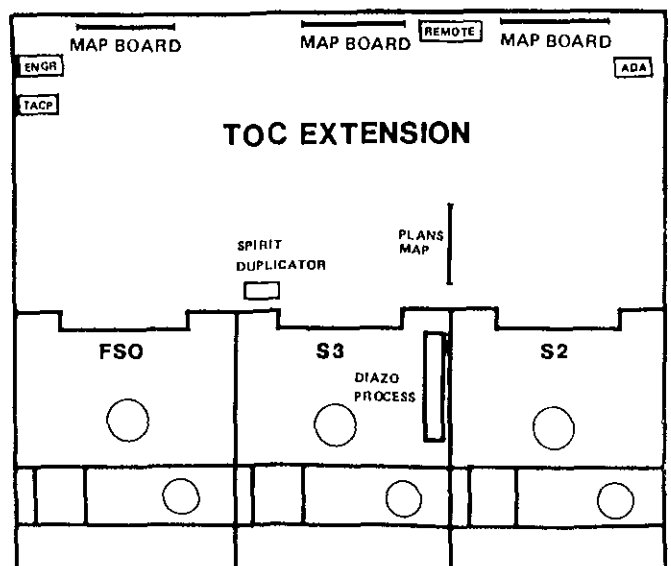


Figure 2. TOC Layout.

why trust and the commander's intent are so important. If the intent is properly understood, these breaks in the communication should not be critical. (This technique is an ideal complement to mission type orders. It is not for everyone, however.)

Another command and control consideration for the task force is the choice of an alternate TOC, which could be the ALOC, the mortar platoon, or the antitank company. The ALOC is the obvious choice. Unlike the other two elements, the ALOC already has the key job of sustaining the task force and has communications established with all of the TF maneuver units to coordinate administrative and logistic matters. By the very nature of its function, the ALOC stays abreast of the combat power of the battalion, monitors the battalion command net, and maintains an up-to-date situation map. Neither of the other two elements does any of these things (except that the AT company commander does monitor the battalion command net, although his company CP does not). Finally, the ALOC is adept at coordinating with higher headquarters and with the task force's subordinate units. (The AT company and the mortar platoon are fighters, not coordinators.) For all of these reasons, the ALOC can go from its sustainment role to that of battlefield manager more swiftly than either the mortar platoon or the AT company.

TOC ORGANIZATION

The TOC is responsible for actual battlefield management, including collecting information, reporting it, and planning and coordinating the operations.

As in the old H-series TOC organization, the J-series TOC is composed of the S-2 section, the S-3 section, the fire support element (FSE), part of the tactical air control party (TACP), and some members of the communications platoon. At times, engineer and air defense representatives will also be present in the TOC.

The main vehicles in the TOC, besides four or five jeeps, are the three M577s belonging to the S-2 section, the S-3 section, and the FSE. A good TOC crew will know and use several different configurations of these M577s, but there is one configuration that best facilitates planning and information flow within the TOC — a side-by-side arrangement as shown in Figure 2.

This configuration provides several advantages over the others, including the standard one shown in FM 71-2J. First, it offers a much larger work area for producing operation orders and conducting briefings. It also increases the survivability of the S-3's M577, sandwiched as it is between the other two vehicles. But most important, this arrangement eases the information flow between the sections.

With the map boards side-by-side, information can be exchanged rapidly between the FSE, the S-3, and the S-2. This information flow can be improved further if the size of the map boards is standardized so that each element uses the same size overlays. This can be done by having the local training aids center build three boards to TF specifications (Figure 3). Each of these boards is covered with plexiglass that can be

removed easily. The boards are protected during movement by the two outside flaps, which fold in. When open, these two flaps contain critical combat information. (Annex G in FC 21-26 has some excellent formats for this type of information.) Overlays are cut to fit the plexiglass, and the bolts to hold the overlays are identically spaced on all the boards so that the S-2 and the FSO can quickly place their overlays on the operations map for coordination.

The keys to effective TOC operations are a detailed TOC SOP and a TOC training plan. A TOC SOP should detail the duties and responsibilities of TOC personnel. This is especially important with the high turnover that many units experience. An SOP may also include, among other things, set-up and tear-down procedures, displacement procedures, eating and sleeping plans, shift guidelines, physical security plans, priorities of work, cross-loading plans and checklists, inspection checklists, vehicle parking lists, and checklists for the officer and NCO in charge. The SOP should be a living document that is used and then changed when improved procedures or techniques are adopted.

The SOP is actually the task force's institutional memory for TOC operations so that when a new S-3 or operations sergeant walks in the door he is not faced with starting from scratch, as is so often the case.

Once the key procedures have been captured on paper, they must be practiced until they become mechanical, and that's where a training plan comes in.

All too often, TOC personnel practice their procedures only when their battalion rolls out the gates of the motor pool to begin a field training exercise (FTX). The TOC may have been in the field once in the previous four to six weeks, perhaps to support a gunnery exercise where the S-3's M577 was used on one range and the S-2's M577 on another. Also during this period the S-3 section probably lost two or three soldiers to normal rotations and gained a like number.

Because of this lack of practice and this turnover of personnel, the TOC usually must spend the first couple of days of an exercise shaking out the cobwebs and retraining itself on displacement procedures. The staff must reestablish priorities of work and produce operation orders. Near the end of the FTX, the TOC will be fairly productive but still won't be running smoothly. The net result is that the companies usually end up acting as training aids for the battalion staff, while the staff struggles to get its act together. When the operations section returns to garrison, day-to-day operations will again consume its time, and TOC operations will revert to their usual low training priority.

It is a real challenge to overcome this garrison-to-field pendulum swing. A first step is to realize that the staff needs a training plan to follow just as much as the maneuver units and that it is a waste of training time and money to take an entire battalion to the field just to train the battalion staff.

The soon-to-be-published ARTEP Mission Training Plan (AMTP) 71-2 (Coordinating Draft) discusses this very issue. It presents a logical methodology for a TF to use in developing staff training plans that parallel and complement the battalion training plan.

Staff training can be conducted using a series of low-cost

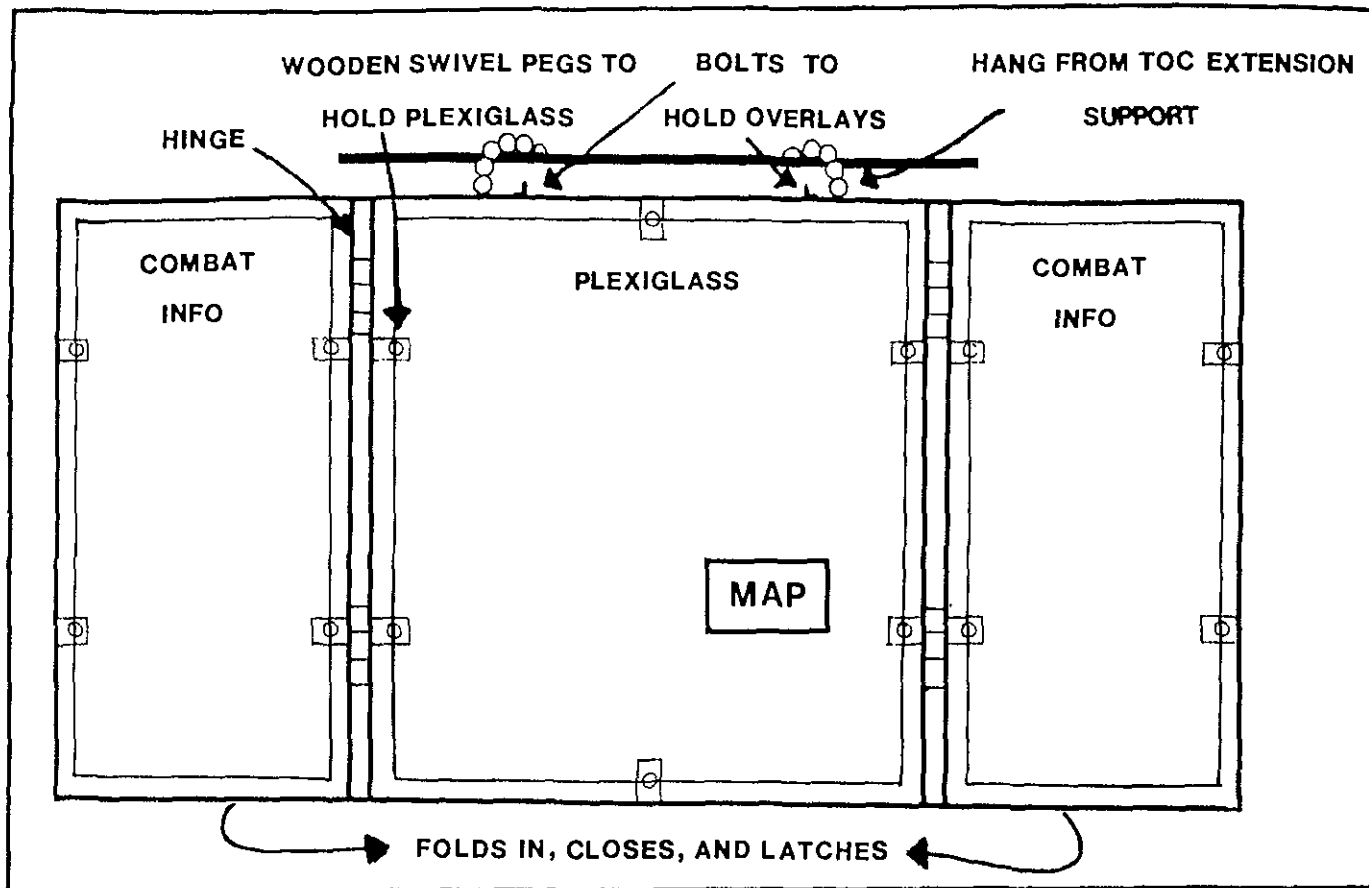


Figure 3. TOC Map Board.

training exercises (map and command post exercises and simulations) in garrison and close-in training areas. The idea is to move from low-cost training exercises to high-cost exercises without wasting time or manpower. Because the staff and the units in the task force are following parallel training programs, both will become gradually more proficient so that they will get the greatest possible benefit from a full-blown FTX.

Another part of TOC operations that gives rise to emotional debate in some units is the TF executive officer's role as second in command (2IC). Our doctrine clearly defines that role and states that during the battle he is "normally" located in the TOC. (Having been in a battalion where the XO was strictly involved in coordinating the combat service support, and then having evaluated a task force on an ARTEP in which the XO as 2IC ran the TOC during the battle, there is no doubt in my mind that the doctrine is correct.) Combat support and service support activities should not suffer while the XO is in the TOC, since he has radio and wire contact with the ALOC.

The TOC provides the best vantage point from which the XO can take over should the TF commander become a casualty. Even though the XO at that point will no doubt be well-versed on the tactical situation, the command and control of the units in contact should pass first to the S-3, who is in the best position to continue the battle. Command should pass to the XO only when he is in a position on the battlefield that allows him to see the fight and effectively control it.

Another key aspect of TOC operations is the TOC's physical

security plan. Two approaches can be taken, neither of which is totally satisfactory.

The first approach is to augment the TOC by taking a squad from one of the line units. This is only partially satisfactory as it provides a six-man squad, but the squad does come with a Bradley that can be used to cover the main mounted avenue of approach into the TOC's area of operations when the S-3 and the TF commander are forward. The main problem with this approach is that it takes away riflemen from a maneuver element that is already short of them.

The alternative is to use personnel from the TOC, along with the soldiers who work in the CP area. The problem here is that there are just not enough soldiers to man an adequate defensive perimeter. In addition, the TOC NCO in charge must closely coordinate his soldiers' schedules to make sure they all get at least three or four hours of sleep.

Regardless of this fact, for the defense of the TOC to succeed, the principal mounted and dismounted avenues of approach must be identified and covered. Dismounted avenues should be covered by soldiers from the TOC. Positions should be designated for the TF commander's and the S-3's Bradleys when they are in the TOC area. These positions should cover the high-speed avenues of approach into the TOC area.

A readily identifiable audio signal such as an air horn should be used to signal an enemy attack. At the sound of the alarm, everyone in the TOC, except for the minimum number required to operate the radios, should move to prepared fighting positions. (This procedure must be rehearsed in both daylight and darkness at each new TOC location.)

A good way to brief everyone in the TOC on the defensive plan is to use a blank acetate-covered board on which the defensive positions can be sketched. Other features that should be added include the sleeping, eating, parking, latrine, and dismount areas.

The key to the successful defense of the TOC is the coordination between the headquarters company's first sergeant or XO, who is responsible for selecting the defensive positions, and the operations sergeant, who is responsible for scheduling soldiers to man them. Both tasks should be completed and all TOC personnel briefed on them within two hours after the TOC arrives in a new location. Then someone in the TOC organization needs to be specifically charged with seeing that the positions are properly sited and dug and that the defensive plan is followed.

Another challenge in the field is to produce orders and overlays in a timely manner and in sufficient quantities that all the members of the TF who have a need to know get the information. The methods I have seen used for this range from jelly roll devices to reproduction machines to field facsimiles to spirit duplicators to mimeograph machines to plain old elbow grease and carbon paper. My preference is a manual spirit duplicator used with an operation order format pre-printed on spirit-duplicator stencils. TOC officers write the order on the pre-printed forms and then reproduce the order and its annexes on the spirit duplicator.

A spirit duplicator is much faster than a field facsimile or reproduction machine, and it doesn't rely on electric current as the others do. It is much cleaner to use than a mimeograph machine and requires less upkeep. The stencils are also much easier to write on.

Overlays are another story. Jelly rolls are hard to come by, and they make only a few copies per roll (about ten). The only other technique is to have a crew in the TOC copy the needed quantity off of a master copy, but quality control is a constant problem, and accuracy also suffers.

Recently, I saw a task force reproduce clear acetate overlays using a photographic process called diazo. The reproduction set (Diazo Process NSN 3610-01-123-7782) can be ordered through the supply system. The only problem is that the film is expensive, hard to get, and often must be locally purchased. Nevertheless, for units that can afford it, this seems to be a good solution to the problem of reproducing overlays.

Command and control and the role of the TOC and the command group in this process have not changed greatly as the Army has moved from H-series to J-series organizations. The command group must still fight the battle, and the TOC must ensure that battlefield management is being accomplished — that orders are being followed; that the plan is working; and that the information flow is maintained. The roles of some staff members have been redefined, most notably that of the battalion executive officer and, to a lesser degree, that of the battalion S-3. Still, the doctrine laid out in FM 71-2J and FC 21-26 provides a solid framework for fighting and winning on future battlefields.

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RIFLE COMPANY

ECCM

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The term "electronic counter-countermeasure" (ECCM) may conjure up images of super-sophisticated underground listening posts full of incomprehensible equipment, or perhaps aircraft electronically zapping enemy communications, radars, or missile guidance systems. Few people would think of ECCM in terms of laying communication wire or using runners in order to maintain radio silence. Nevertheless, both the electronic warfare (EW) wizards in their listening posts or planes and the rifle company soldiers laying wire are using ECCM techniques.

Convincing the riflemen that their efforts are important and effective, though, is another matter. For one thing, during most of their tactical training periods, their company's ECCM efforts may seem inconsequential because there is little or no tangible feedback from them. They also have difficulty understanding that most of their company's ECCM efforts are defensive in nature rather than offensive, that rather than being used to hack off an enemy's electronic warfare (EW) arm, they will be used more like a shield to blunt an enemy's EW sword thrust. That shield must remain raised at all times; if it is dropped, even for a second, the sword will strike home.

How, then, does a company hold onto its ECCM shield and use it to best advantage? Before that question can be answered, some definitions and explanations are in order.

Electronic warfare (EW) is officially subdivided into three general categories:

- Electronic support measures (ESMs)—direction finding and monitoring — are used to locate the geographic position of an enemy and to listen to his electronic signals.
- Electronic countermeasures (ECMs)—jamming and deception—are used to nullify an opponent's electronic equipment.
- Electronic counter-countermeasures (ECCMs)—protecting, evading, concealing, and covering—are used to negate an opponent's ECM attack on friendly electronics or to defeat his ESMs.

All three of these subcategories of EW are applied across the three radio frequency bands that a rifle company uses — high frequency (HF), very high frequency (VHF), and ultra



high frequency (UHF). In each of these bands, radio waves behave differently. This is especially true concerning ground waves, which travel through the air close to the ground, and skywaves, which travel to the upper atmosphere, bounce off the ionosphere, and come back down to the ground. This means that ECCM rules that work in one band will not necessarily work in another.

Specifically, the HF band uses both skywave and ground-wave communication. The skywave signal can give much greater range for communications and is the only way short of having a satellite that an individual radio can communicate over the horizon. But the atmosphere introduces rapidly changing variables that can affect the quality of skywave communications. For example, both time of day and atmospheric refractivity can affect how well communications perform.

Fortunately, there are some indicators that will help a radio operator decide whether he can use skywave communications. These indicators are the maximum usable frequency (MUF) and the lowest usable frequency (LUF), which can be computed daily by the battalion communications officer or the communications chief. These readings tell an HF radio operator whether his assigned frequency falls within the bracket of usable skywave frequencies. (One of the reasons for this bracket of frequencies is that the higher the frequency is, the less likely the waves are to bounce off the ionosphere and return to earth.)

In the VHF and UHF portions of the spectrum, there are

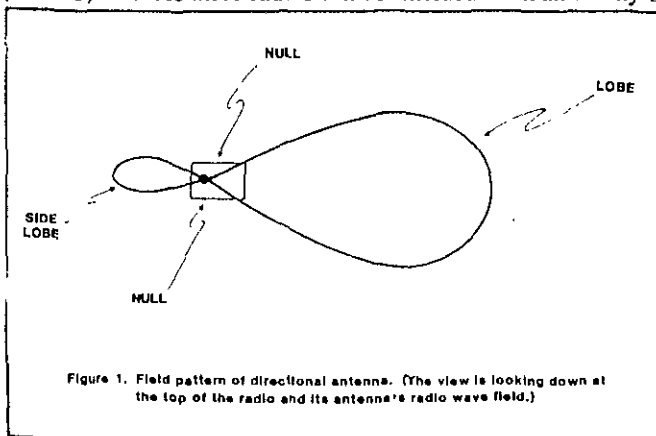
no skywave communications to speak of. The radio waves that are pointed toward the ionosphere pierce right through it and keep going out into space. The only way to get over-the-horizon communications with an individual VHF or UHF radio is to have a relay station such as a satellite or an aircraft. Otherwise, VHF and UHF signals must follow a groundwave path, which, for these frequencies, is commonly called line of sight (LOS) communications. Normally, if a radio operator can't see the point he wants to communicate with — if a mountain is in the way, for example — he can't communicate. The primary difference between VHF and UHF groundwaves is the number of obstacles in the line of sight that the waves can penetrate. For instance, heavy forests interfere more with UHF groundwave signals than they do with VHF groundwave signals.

Regardless of which type of groundwave signal is used, an important concept to understand is how to point the radio waves in the proper direction. To do this, quite simply, the radio operator uses his antennas.

For purposes of this article, there are two kinds of antennas — omnidirectional and directional. With an omnidirectional antenna, the radio waves travel outward 360 degrees in all directions just as the light from a table lamp travels out in all directions. Conversely, a directional antenna is pointed toward the desired direction of communication, just as a flashlight is focused in a single direction.

The directions in which antenna radio waves travel are generally known as field patterns. When a field pattern becomes focused, the beam of radio waves is referred to as a "lobe" (Figure 1). The areas where there are no radio beams are called "nulls." The width of a lobe (in degrees) and the direction in which it is pointed are determined by the type of antenna used. At company level, directional antennas are usually of the field expedient kind, because the antennas issued with company radios are predominantly omnidirectional.

On the assumption that a company commander, in terms of tactical communications, is interested primarily in shielding his voice radios, some ECCM techniques have been consolidated and boiled down to three checklists, which are included here. The techniques shown apply only to three specific radios: the AN/PRC-104, which handles the HF band (Table 1); the AN/PRC-77, which handles the VHF band (Table 2); and the AN/PRC-75, which handles the UHF band (Table 3). If these three radios can be shielded from an enemy's



EW capabilities, then the company's major fire support nets and command and control nets can be maintained.

To use these tables, a radio operator follows a three-step process:

- He finds out from the S-2 what combination of EW capabilities the enemy has.
- He determines whether his company is conducting offensive operations (taking objectives) or defensive operations (digging in).

- He looks at the table under the appropriate enemy EW capability and then under the appropriate column — offense or defense. Everywhere there is an "X" in this column, he uses the ECCM technique shown on the far left of the table. If the enemy has more than one of these EW capabilities, the radio operator uses every technique that has an X marked beside it, even if it is marked in only one of the multiple EW capability columns that apply to his situation.

An operator's ECCM actions, as shown in the tables, are divided into two general classifications. The first classification I call "methods ECCMs" — techniques an operator can use to minimize enemy ESMS and ECMs relying only on the equipment available with the standard radios. Methods ECCMs are the operator's actions that do not involve the use of additional hardware. The second classification, which I call "hardware ECCMs," are actions that do involve the construction or introduction of additional hardware elements.

Under these two broad classifications, the four basic EW capabilities — monitoring, direction finding, deception, jamming — can be analyzed and possible tactics can be formulated for each classification of company level ECCM actions.

Monitoring

First, in order to understand how an enemy monitors our radios, let's review the geometry of a general tactical situation and begin to make some distinctions as to how that geometry changes during fluid wartime operations. Referring to Figure 2, our radios will be located primarily along the forward edge of the battle area (FEBA) with the rifle companies. One to two kilometers behind these front lines will be the battalion command post (CP). The enemy's ability to monitor is located on the opposite side of the FEBA from friendly units within relatively short range.

The Soviets, for example, have a large number of radios that can intercept our signals, with many of these available to their front line combat forces and not just to their specialized EW units. Consequently, monitoring should always be considered a threat, even when friendly intelligence sources report no specialized enemy EW unit in the area.

In both offensive and defensive operations, the distances between front line and battalion CP radio links remain relatively the same. As a result, the primary emphasis is on groundwave rather than skywave propagation, since the distances involved are normally less than 25 kilometers. There are some clear distinctions, however, between these two types of operations. These distinctions can be summarized in the word "mobility." Company level radios have only one type of

antenna for an operator on the move — the whip antenna, which is omnidirectional and limited to groundwave propagation. In addition, offensive mobility affects communications in that it reduces the number of alternate methods of communication available to the company, such as wire-linked field phones. This results in additional reliance on the radios as the essential communication link. Throughout both offensive and defensive operations, then, the ECCM objective is to avoid being listened to by the enemy.

To ensure a distinct understanding of when to apply specific techniques of "methods ECCM" and when not to, the appropriate tactics must be defined separately for offensive and defensive operations.

Since in offensive operations no rapidly responsive alternate means of communication is available to the company, it must rely on its radios as its *primary means of communicating* with its platoons, its supporting arms, and the battalion CP. Since the company *must* talk by radio, it really has only four ECCM techniques with which to counter *monitoring*:

Brevity codes. The battalion S-3 can pre-establish codes to indicate accomplished tasks or standard phrases. The extent to which these codes are used is left to the individual units involved, but too many can become confusing and counterproductive.

Short-burst transmissions. This technique consists of limiting transmissions to three seconds or less, which makes it more difficult for the enemy to identify and monitor a friendly frequency. But operators must not fall victim to the common misinterpretation that they can carry on a conversation using a series of 50 or 60 three-second bursts. This is not good ECCM, because the enemy will find the frequency. The three-second burst is most useful when used in conjunction with a brevity code.

Alternate frequencies. At randomly prescribed times during the day, or when there is some indication of enemy monitoring activity, the operator can temporarily frustrate that

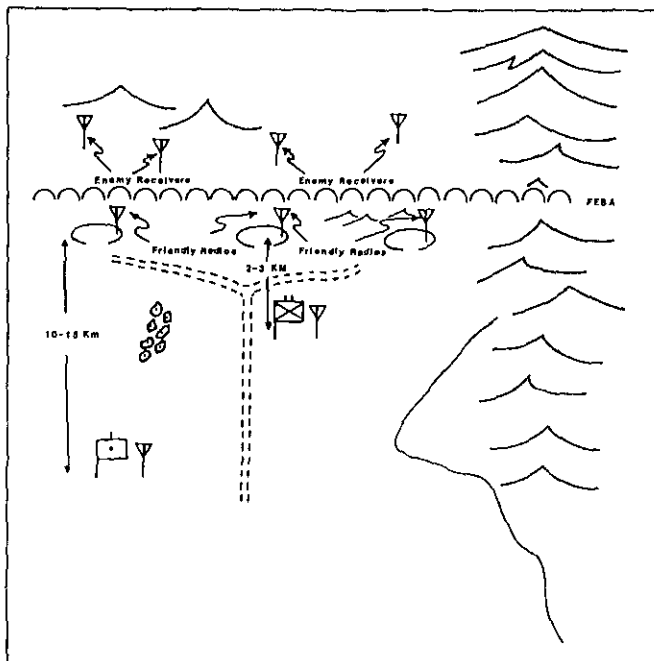


Figure 2. General Tactical Situation.

Overall Company Ops ECCM Technique	ENEMY EW CAPABILITIES								
	Monitoring		Direction Finding		Deception		Jamming		
	OFF	DEF	OFF	DEF	OFF	DEF	OFF	DEF	
METHODS ECCM									
Brevity Codes	X	X	X	X	X	X	X	X	X
Short Burst Transmissions	X	X	X	X	X	X	X	X	X
Alternate Frequencies	X	X	X	X	X	X	X	X	X
Higher than MUF	X	X	X	X	X	X	X	X	X
Authentication Codes					X	X			
Alternate means of Communication		X		X		X		X	
Terrain Masking		X		X		X		X	
HARDWARE ECCM									
Secure Voice	X	X			X	X			
Directional Antennas		X		X		X		X	
Horizontal Antennas									X

Table 1. AN/PRC-104 (HF) ECCM Techniques.

activity by changing frequencies. This technique is essentially a *crude method of manual frequency hopping*. It should be noted, however, that extensive prior coordination is required among all members of any radio net using this technique to ensure a smooth *changeover in frequencies*.

Higher-than-MUF frequencies. This technique applies only to HF communications in general and to the AN/PRC-104 in particular. It limits *monitoring by enemy receivers* that rely on skywave propagation. By using a groundwave antenna and by operating on frequencies that are higher than the maximum usable frequency for skywave propagation, the AN/PRC-104 operator can effectively keep the entire skywave class of enemy receivers from monitoring his transmissions. To use this technique, the AN/PRC-104 must be within groundwave range of the opposite end of the radio link.

It is appropriate here to clear up a common misinterpretation of when to use ECCM during offensive operations.

Specifically, many inexperienced radio operators fail to realize that the need for radio silence or reduced radio communications at the *outset of an operation* changes dramatically once enemy contact is made. Before contact, the objective is to hide the company's frequencies from the enemy. Once engaged, though, the enemy knows where the company is. At that point, radio operators should talk freely and let the company commander, the battalion CP, and the supporting arms know what they need. In short, radios should be used to their maximum advantage at this point so that the enemy can be destroyed before he can react fully.

In defensive operations, the operator has more flexibility in the techniques available for "methods ECCM" than he has in offensive operations. This flexibility stems primarily from the variety of alternate communication means available in the defense. The radio operator can use not only the same four "methods ECCM" used in offensive situations but also the following additional techniques:

Alternate means of communication. In the defense the reliability, speed, and number of alternatives to radio wave

transmission increase. The specific methods available to the company in the defense are field phone wire links and courier service. (Both of these are also possible in the offense, of course, but dragging wire in a footmobile offense will prove highly unreliable; and using runners is not nearly as reliable as in the defense. In the defense a courier knows where the company position is and therefore where he is going; in a mobile offense he must hunt around to find a unit that is moving.)

As in other ECCM techniques, there are some common misunderstandings about the use of alternate means of communication within a company. In particular, platoon leaders may interpret a company commander's actions as inconsistent if they (the platoon leaders) are required to maintain radio silence and use couriers or wire while the forward observers from the supporting arms are allowed to use their radios. They should understand, though, that the distances between the forward units and the actual fire support batteries, combined with operational demands, frequently make it impossible for the supporting arms forward observers to use alternate means of communication.

The necessity for the supporting arms to use their radios in no way nullifies the platoons' efforts at radio silence; in fact, this makes these efforts even more critical. For example, an enemy's radio monitors maintain logbooks and chart the company's radio usage. From this, they can determine when the company is likely to change from defensive to offensive operations if its overall radio usage increases dramatically. Consequently, if distance demands that our supporting arms observers use radio links, the platoon links within the company must use alternate means of communication to reduce overall company radio usage.

Terrain masking. In a defensive situation, the company has time to put prominent pieces of terrain between itself and the enemy receivers. The company's critical nets (supporting arms and the link to the battalion CP) are trying to talk back from the FEBA to the rear area while the enemy receivers are in the opposite direction on the other side of the FEBA. Mountains or hills between the company's radios and the FEBA, therefore, will not affect the company's communications but

Overall Company Ops ECCM Technique	ENEMY EW CAPABILITIES							
	Monitoring		Direction Finding		Deception		Jamming	
	OFF	DEF	OFF	DEF	OFF	DEF	OFF	DEF
METHODS ECCM								
Brevity Codes	X	X	X	X	X	X	X	X
Short Burst Transmissions	X	X	X	X	X	X	X	X
Alternate Frequencies	X	X	X	X	X	X	X	X
Authentication Codes					X	X		
Alternate Means of Communication		X		X		X		X
Terrain Masking		X		X		X		X
HARDWARE ECCM								
Directional Antennas		X		X		X		X
Horizontal Antennas								X

Table 3. AN/PRC-75 (UHF) ECCM Techniques.

will hinder an enemy's monitoring capability. It should be noted, though, that the operators cannot remote their antennas any great distances from their radios because of equipment limitations. Consequently, the use of terrain masking may be limited in situations where a terrain feature could diminish the ability of the supporting arms observers to see and control air, mortar, or artillery strikes along the FEBA.

As for "hardware ECCM," both standard issue and field expedient devices can be used to counter monitoring:

Secure Voice. In the mobile offense, an operator will have little time to construct field expedient ECCM devices. Therefore, he must rely on standard issue devices. The only real standard issue device available to a radio operator, though, is a secure voice crypto device such as those in the Parkhill and Seville family of equipment, and secure voice devices are presently available only with the AN/PRC-104 and the AN/PRC-77. Secure voice methods do not apply to the AN/PRC-74, but they will with its replacement, the AN/PRC-113. (Within a decade, in fact, all transmissions will be encoded.)

A defensive situation, on the other hand, gives an operator a chance to construct field expedient devices to improve his ECCM capabilities.

What kind of such devices can an operator construct in the field? Since he wants to make it harder for an enemy monitor to pick up his signal, he can reduce his radio wave power output. But how does he reduce the power of the signal reaching the enemy while maintaining or increasing the power of the signal reaching his CP? The answer is directional antennas.

Directional antennas. Considering the position of enemy and friendly units with respect to the FEBA (Figure 2), and remembering the omnidirectional field patterns of the standard whip antenna, the operator can achieve his ECCM objective by reducing the lobes of the field patterns pointing in the direction of the enemy while maintaining or increasing the lobes pointing in the direction of the friendly receivers. He can build field expedient directional antennas from material normally at hand in the field, such as communication wire.

It would be ideal if a directional antenna's nulls could be pointed directly at the enemy receivers, but a radio operator will probably not know the enemy's exact locations. Nonethe-

Overall Company Ops ECCM Technique	ENEMY EW CAPABILITIES							
	Monitoring		Direction Finding		Deception		Jamming	
	OFF	DEF	OFF	DEF	OFF	DEF	OFF	DEF
METHODS ECCM								
Brevity Codes	X	X	X	X	X	X	X	X
Short Burst Transmissions	X	X	X	X	X	X	X	X
Alternate Frequencies	X	X	X	X	X	X	X	X
Authentication Codes					X	X		
Alternate Means of Communication		X		X		X		X
Terrain Masking		X		X		X		X
HARDWARE ECCM								
Secure Voice	X	X			X	X		
Directional Antennas		X		X		X		X
Horizontal Antennas								X

Table 2. AN/PRC-77 (VHF) ECCM Techniques.

less, he will know their general direction (that is, the opposite side of the FEBA) and can present the enemy receivers with at least the directional antenna's reduced sidelobes if not (with luck) the nulls themselves. (Many publications describe specific directional antennas or precise construction methods.) It should be noted, however, that the use of directional antennas with the AN/PRC-75 would be rare since that radio most often requires omnidirectional patterns to talk to friendly aircraft moving rapidly about the battlefield.

Direction Finding

Aside from these enemy monitoring ESMs, one that is potentially much more dangerous to a rifle company is direction finding (DF). While the objective of measures taken against monitoring is to deny the enemy the content of the company's transmissions, for direction finding it is to deny him the knowledge that the company is even transmitting.

In practical terms, most of the ECCM techniques that can be used against monitoring can also be used with confidence against direction finding. The secure voice technique is an exception. For direction-finding purposes, secure voice transmissions are just as good to the enemy as transmissions sent in the clear. (ECCM techniques that are applicable in combatting DF are summarized in the DF column of Tables 1, 2, and 3.)

Imitative Deception

Imitative deception, a type of enemy ECM, requires that the enemy be able to do two things: monitor us on our frequencies and employ a skilled linguist to deceive our radio operators or to elicit information from them.

Since the enemy's success depends directly on his monitoring capability, all of the previously developed ECCM techniques for use against monitoring also apply in this case, along with an additional technique — authentication.

Authentication codes are pseudo-randomly generated codes an operator can use to verify the authenticity of any suspicious station on his net. The codes are disseminated daily and can be employed even when no suspicious messages have been received, just to make sure a highly skilled linguist is not operating against the unit. (The appropriate techniques to use against imitative deception are summarized in the tables.)

Jamming

Jamming — the intentional introduction of noise power to a receiver so that the operator cannot understand the signals

transmitted — is, for purposes of this discussion, the most dangerous type of ECM. The point to remember is that this is a reception problem for the radio operator and not a transmission problem.

The ECCM techniques to be used against enemy jamming can be summed up in two steps: First, "methods ECCM" can be used to keep him from knowing our operating frequencies. This means practicing the same techniques used against direction finding. Second, "hardware ECCM" techniques can be used to shield our radios from the jammer's power:

Directional antennas. Just as a radio operator can use directional antennas to prevent the enemy from monitoring his transmissions, he can also use directional antennas to reduce or eliminate the jamming power a friendly receiver gets. He does this by pointing the antenna's nulls in the direction of the enemy.

Horizontal antennas. He can also use field expedient antennas constructed to be horizontally polarized. Since most Soviet groundwave tactical jammers are vertically polarized, a radio receiver with a horizontally polarized antenna would be largely unaffected by the jamming.

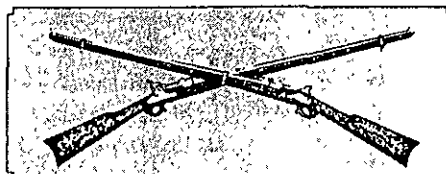
(The principle behind this can be demonstrated with two pairs of polarized sunglasses. If both pairs are put on, one over the other, the sun can be seen through them. But when one pair is removed and rotated 90 degrees with respect to the other, the sun is completely blocked out.)

When we rotate our antennas to a horizontal polarization, we are doing the same thing to the jammer's power that the rotated sunglasses do to the sunlight. Of course, both ends of the friendly radio link must have the same polarization.

Additionally, horizontal polarization will diminish the groundwave distance that the radio wave can travel, so it cannot be used to great effect when opposite ends of the friendly line are on either end of the horizon. In other words, operators must plan carefully and be selective when using horizontally polarized antennas.

In summary, there are electronic counter-countermeasures that can be effectively used at company level against an enemy's electronic warfare capabilities. All a company commander and his radio operators need to keep their ECCM shield raised is a little knowledge and a lot of confidence. The guidelines offered here can serve as a starting point from which they can build that knowledge and confidence.

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TRAINING NOTES



Bradley Gunnery

CAPTAIN ROBERT W. RADCLIFFE
STAFF SERGEANT GREG S. BURNETT

Since the fielding of FM 23-1 (Test), Bradley Fighting Vehicle Gunnery, in December 1983, numerous conferences and meetings, formal and informal, have been conducted concerning Bradley gunnery. The result has been a constructive interchange of thoughts and ideas, many of which have been incorporated into a new FM 23-1, which is planned for distribution in March 1986.

Thanks largely to field experience and the lessons learned from it, and to a close working relationship between the Infantry School and the cavalry trainers at Fort Benning, this greatly improved gunnery manual reflects the evolving development of the Army's Bradley force.

Like other gunnery programs, Bradley gunnery is designed to train soldiers to combat proficiency and to maintain that proficiency, which is evaluated through skills testing and a series of standardized live fire tables. The training tasks for each of the 12 gunnery tables reinforce skills in a progressive sequence.

The tables can be grouped into two major components: subcaliber and full caliber gunnery (see chart).

Tables I-IV are designed for use on scaled ranges, with minimum cost in ammunition and range overhead. (The more common training devices available are the Brewster and Bradley subcaliber devices.)

These tables reinforce the basic gun-

nery skills that the crew of the Bradley must master before they can qualify. These first four tables, because they can provide an excellent opportunity for turret cross training within the Bradley squad, should be fired as often as possible.

Table V is fired on a full-scale range at one-half scale targets using the Bradley's coaxially mounted 7.62mm machinegun. This is the first table in which crew training occurs on a moving

Bradley. A crew's teamwork — developed during preliminary gunnery training and firing the previous subcaliber tables — is refined as the crew engages stationary and moving targets deployed in tactical arrays.

The full caliber tables, VI-XII, consist of exercises involving stationary and moving Bradleys firing at stationary and moving, single and multiple target arrays. They are conducted during daylight hours and at night.

BFV GUNNERY TABLES

SUBCALIBER

- I Zero/manipulation/range card.
- II Stationary Bradley—stationary/moving targets.
- III Stationary Bradley—adjustment of fire.
- IV Stationary Bradley—stationary/moving tables.
- V Vehicle team subcaliber table.

FULL CALIBER

- VI-A&B* Vehicle team baseline table.
- VII-A&B* Vehicle team combat table.
- VIII-A&B* Vehicle team qualification table.
- VIII-C Rifle team qualification exercise.
- VIII-D Infantry squad qualification exercise.
- IX-A&B* Scout section combat table.
- X-A&B* Scout section qualification table.
- XI-A&B* Infantry platoon mounted table.
- XII-A&B* Infantry platoon mounted qualification.
- XII-C Infantry platoon dismount element qualification exercise.
- XII-D Infantry platoon qualification exercise.

* A = Day table, B = Night table.

Table VI is the first one that requires a crew to fire the vehicle's 25mm automatic gun and the 7.62mm coaxial machinegun. The table is fired with the vehicle in a stationary position, which permits trainers to coach and instruct a crew on the conduct of full caliber fire.

Tables VII and VIII require Bradley crews to engage realistic tactical target arrays with all the turret-mounted weapons during both day and night from a stationary position and while moving. Table VII is essentially a practice table for Table VIII, which is the first Bradley gunnery qualification table. In it, Bradley crews are evaluated on crew performance and quick, accurate fire.

Both infantry and cavalry scout crews fire these first eight gunnery tables, because they emphasize turret-related skills that are common to both. Tables IX and X, however, are fired only by cavalry scout sections and Tables XI and XII only by infantry platoons. Table IX is the live-fire practice for Table X, which is the scout sections' qualification table; likewise, Table XI is the practice for qualification Table XII for the infantry platoons. Since both scout section and infantry platoon tables are considered tactical gunnery exercises, the scoring has been expanded to include control of fires, reporting procedures, movement techniques, and command and control.

As a result of a Bradley gunnery conference in May of last year, Bradley gunnery was expanded to include exercises specifically designed for the infantry squad and its rifle team as well as for the infantry platoon and its dismount element. These new exercises have been incorporated into Tables VIII and XII.

Tables VIII-C and XII-C, for the first time, give the dismounted Bradley infantry an opportunity to be tested during gunnery exercises. Both tables can be conducted as either live-fire or MILES evaluations on ranges in local or major training areas, either separate from or in conjunction with crew gunnery.

Table VIII-C, which is conducted from prepared defensive positions during daylight, consists of two exercises that require a rifle team to conduct simultaneous engagements at near and far dismounted infantry and vehicle targets. Table XII-C includes similar but more numerous target opportunities. This table is conducted during a daylight offensive scenario and during both day and night defensive scenarios. Both dismounted tables are scored on accuracy, firing position selection, and fire distribution and control.

Tables VIII-D and XII-D combine all of the Bradley infantry training into a squad and platoon qualification. Table VIII-D consists of three daylight exer-

cises — dismounted engagements, firing-
port-weapon engagements, and vehicle crew engagements. Table XII-D also offers both day and night dismounted and mounted target engagements. Each of these tables may be fired on a separate range dedicated to these tasks or fired as part of VIII-A for squad qualification and XII-A and -B for platoon qualification. For further flexibility, units also have the option of shooting these as live-fire or as MILES exercises. The two major scoring standards for squad and platoon qualification include fire distribution and control within the dismounted and mounted elements and fire coordination between these same two elements.

Today's Bradley gunnery program tests the combat readiness of Bradley soldiers and their fighting vehicles through tables that are progressive in nature and through demanding, realistic standards.

Bradley gunnery provides a training challenge to all Bradley infantrymen and cavalymen to train to fight and win.

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Master Gunner Course

SERGEANT FIRST CLASS RUSSELL K. BUTTS

For the past three years, the 12-week Master Gunner Course at Fort Benning has been training master gunners to serve in Bradley battalions and companies — both Active Army and Reserve Component. Recently, as a result of a decision to place them at platoon level as well, the demand for master gunners has grown considerably. And the course has changed

in response to changing needs.

What do unit master gunners do? In brief, they are primarily training managers for and system advisors to their commanders. They plan training for Bradley gunnery, forecast ammunition needs, and coordinate necessary training resources to support the gunnery training program.

More specifically, master gunners as-

sist their subordinate units in the conduct of gunnery and crew drills for integrating and certifying newly assigned personnel. They are well versed in the organizational maintenance of the unit's fire control, electrical, and weapon systems, and are prepared to help maintenance personnel troubleshoot these systems, they are especially familiar with turret mainte-

nance. They supervise live-fire gunnery and monitor crew or squad proficiency. They are trained to assess their units' posture and to implement gunnery programs that are designed to sustain skills and correct deficiencies.

Because of the scope and difficulty of these duties, only the best qualified non-commissioned officers should be selected to attend the Master Gunner Course. To be selected, an NCO must:

- Be 11M/19D Bradley qualified.
- Be a staff sergeant or platoon sergeant, or, in MOS 11M, a sergeant.
- Have a minimum GT score of 100.

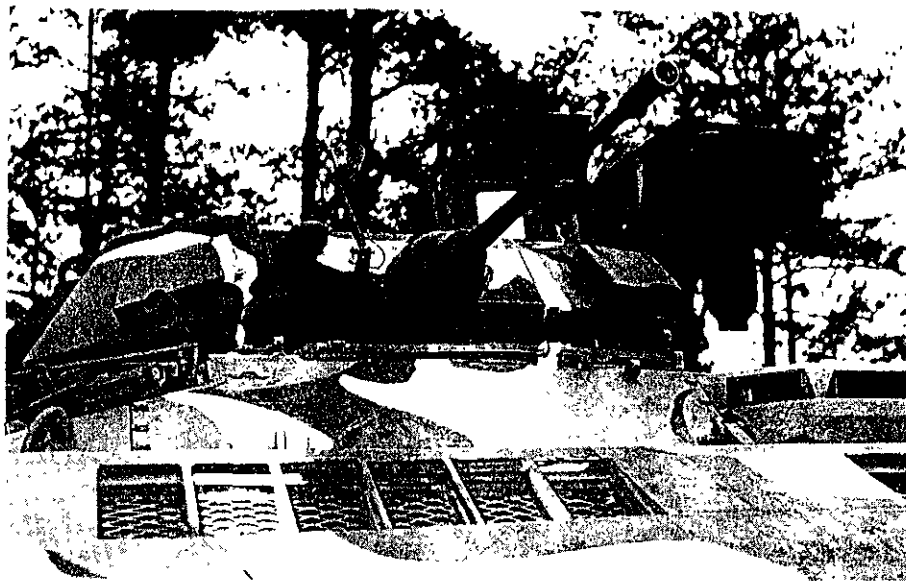
(Reading and comprehension skills are critical.)

- Be assigned to a Bradley unit and have 12 months retainability in that unit.
- Meet the Army's height and weight standards. (Students are weighed during processing.)
- Be physically fit. (Students must pass the APRT administered before graduation.)
- Be selected by his battalion or squadron commander.

The instructors assume that the students are already proficient in *all* 11M Skill Level 3 tasks, and the POI is designed for that level. Previously, because of the lack of experienced noncommissioned officers in CMF 11M, the course taught Skill Level 1 and 2 tasks as well. Now, however, the students are given the Bradley Commander/Gunner Certification Test (BCGC) on the second day of training. Only those students who achieve a passing score of 70 percent (and 100 percent on all missed tasks on a retest) are allowed to continue in the course.

The Master Gunner Course concentrates on the functional duties of a master gunner — gunnery, maintenance, training management, range preparation, and tactics. The students spend many hours on organizational preventive maintenance checks and services (PMCS) on the hull, turret, and weapon systems, with most of the maintenance instruction focusing on the turret and the weapon systems.

Classroom instruction is reinforced with practical exercises using test equipment that is introduced during the instruction. System troubleshooting is also taught so the students will be able to identify turret problems accurately.



Because of the Bradley's many weapon systems, master gunners are invaluable to their commanders in developing and implementing unit gunnery programs.

Another topic that the course covers in depth is gunnery techniques. Gunnery is divided into two categories — prefire gunnery and target engagement, with most of the instruction on the latter. Prefire gunnery consists of instruction in target acquisition, range determination, fire commands and methods of engagement, and manipulation training.

Bradley Tables I through XII, the Unit Conduct-of-Fire Trainer (U-COFT), and other gunnery training devices are taught so the students will become thoroughly familiar with the execution and evaluation phase of the master gunner's duties.

The training management instruction in the course is designed to teach the students techniques for assessing unit skills and shortcomings to help their commanders develop productive gunnery programs. This instruction shows the students how to tailor programs to fit their units' needs and then how to support those programs with timely requests for resources.

The course also provides instruction on preparing ranges, using ballistic firing tables and scaled ranges, and setting up, operating and breaking down ranges. For live-fire ranges, the students are taught how to prepare surface danger area diagrams to make sure the live fire exercises are conducted safely.

To put the technical aspects of the BFV in perspective, students are now given 20 hours of tactical instruction.

Throughout the 12 weeks of the course,

the students are evaluated on their proficiency in master gunner skills. To graduate, a student must pass the APRT, receive a "GO" on all hands-on tests, and maintain an academic average of 80 percent. Each student receives an academic evaluation report for the course.

Although the Bradley Master Gunner Course has defined objectives, it is an evolving course. Comments from students and from units in the field help the Bradley instructors tailor the course to fit the needs of the Army. In fact, recent responses from the field have brought about some changes in the focus of instruction — more time is now spent on unit assessment, ammunition management, conduct-of-fire training, and sub-caliber training.

Master gunners have proved invaluable at all levels in helping commanders develop and implement unit gunnery programs. Through competitive unit selection processes, the responsiveness of the Master Gunner Course, and the commanders' effective use of their master gunners, the Army can now train highly competent crews capable of turning a Bradley fighting vehicle into an impressive fighting machine.

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Bradley Training Devices

DAVID W. REISS

"Steel on target!"

"Live fire is the only way to train."

"If you're not miserable, wet, and dirty, you can't possibly be training."

These seem to be the conventional thoughts on training among infantrymen, but the introduction of high-technology, high-cost weapon systems has forced many to reconsider.

The Bradley infantry fighting vehicle (BIFV) is a perfect example of a high-tech, high-cost infantry weapon system. The ammunition is expensive for its TOW, its 25mm chain gun, and its 7.62mm coaxial machinegun, not to mention the cost of operating the vehicle. In addition to cost, ranges are also a problem. Tanks and Bradleys must compete for the same limited ranges and will do so in ever-increasing numbers in the future.

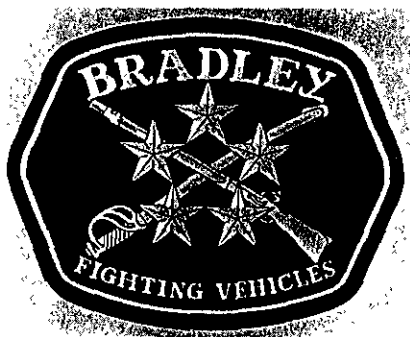
Both ammunition costs and the shortage of ranges will also limit the number of engagements each Bradley will be able to fire. For example, using the 25mm gun's high-rate-of-fire mode of 200 rounds per minute, a unit could fire its entire year's allocation of ammunition in five minutes. And the crew of a BIFV will get to fire a live TOW only once every four years.

The training challenge for the Bradley is magnified by the need to train alternate crews and gunners. With the M113, any one of the squad members can man the .50 caliber machinegun. This is not so with the Bradley, for special training is required for a soldier to move into its turret. In fact, alternate crews have to be as well trained as primary crews, because there is so much more they have to know.

When all of these factors are considered, the logical solution is to develop

more efficient ways to train — and this means using training devices.

In its search for suitable training devices for the Bradley, the Infantry School chose several existing or prototype devices, and the U.S. Army Infantry Board evaluated them in a project known as BIFV Gowen South. This project included testing several programs of instruction in which these devices were used for certain BIFV sustainment gunnery training events. (For details of these tests, see *INFANTRY*, July-August 1985, pp. 7-8.) Primarily, this meant



comparing the test soldiers' performance on the devices with their live fire performance on the squad combat qualification exercise (SCQE).

When the results of these tests indicated that the devices were effective, the School began formulating a Bradley training strategy that would include the use of some of them. The devices were considered on the basis of what they could do, what they would cost, what they would save, and how easy they would be to use and maintain. (These efforts included, of course, coordination with various departments of the School, higher headquarters, and field units.)

Under the proposed training strategy, still under consideration, the following devices will be used:

- **The Unit Conduct-of-Fire Trainer (U-COFT).** The U-COFT is a full-scale Bradley simulator that uses computer-generated imagery to produce every possible gunnery engagement or situation. It will replace certain of the present stationary vehicle live fire engagements.

- **The Bradley Gunnery Missile and Tracking System (BGMTS).** The BGMTS is an indoor trainer that uses an actual vehicle, 16mm film, and infrared and laser gunnery engagements. It will replace selected subcaliber gunnery tables.

- **The Precision Gunnery System (PGS).** The PGS is an outdoor trainer that uses an eyesafe precision laser to engage targets on an actual range, or vehicle against vehicle, using laser-target interface devices. It will replace certain moving vehicle live fire tables.

- **The Thru-Sight Video (TSV).** The TSV is a recording and critique device that allows for video recording through the Bradley's sights. It allows the crew to see not only what they did but also how well they performed. It will be used on all qualification tables.

- **The Bradley Subcaliber Device (BSCD).** The BSCD is a specially designed training device that uses the M16 rifle. It will be used in place of the BGMTS until that device can be procured.

The devices will be used for train-up gunnery exercises only. They will not be used for qualification firing.

With the devices, therefore, home-station gunnery training will take on new importance and significance. If a unit

establishes and maintains a device-based program of three to four hours a month for each crew, this training strategy will pay dividends, because over an annual gunnery cycle, the devices will enable a crew to increase its number of engagements from 121 to more than 1,400. (These figures are based on 40 engagements per hour for three to four hours per month using both the U-COFT and the BGMTS.)

At the same time, these devices will save on ammunition and vehicle operation costs; will reduce planning time, range congestion, and range personnel requirements; and will enable a unit to train more soldiers.

In the final analysis, the Infantry School can only recommend how these training devices should be used. Their integration into unit training will be a task for leaders in the field. But they will

work. In fact, given the live-fire limitations, they must.



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Why Deflection?

MAJOR PETER R. MOORE

In INFANTRY's November-December 1985 issue, there appeared an article entitled "Mortaring: Can We Now Move Forward?" by Warrant Officer-1 Keith F. Hoyle of the British Army. The author, then attached to Fort Benning as part of a U.S.-British exchange program, discusses some problems with our current mortars and considers some possibilities new technology will make available. I am in partial agreement with Mr. Hoyle's proposals and would like to address one particularly interesting question — specifically, his proposal that we do away with deflection and lay mortars by azimuth, thereby simplifying fire direction procedures.

Field artillery has been laying on deflection angles ever since modern panoramic sights (6400 mil) were invented around the turn of the century, and mortars eventually adopted the same system.

Azimuths increase as the barrel turns clockwise, so the rule is Right Add, Left Subtract (RALS). Deflections increase as the barrel turns counterclockwise, so the rule is Left Add, Right Subtract (LARS) (or, as the Marines say, Port Increase, Starboard Subtract). Although fire direction center (FDC) students find this dis-

tingtion a bit confusing, they eventually get used to it.

Mr. Hoyle is most unusual in refusing to take deflection for granted, in investigating the matter, and in concluding that deflection should be abolished. Indeed, it seems that plotting and laying on azimuths is simpler, and simplicity is certainly to be desired. Mr. Hoyle is slightly in error, however, in the following statement from his article:

The sight scale rings, now numbered progressively in a counterclockwise direction, should be numbered in a clockwise direction in the same way as the aiming circle. This very simple modification would allow the complicated and unnecessary use of deflection to fade into obscurity.

This implies that deflection is a counterclockwise angle. Although this does seem natural — when deflection increases, the barrel traverses left (counterclockwise) — deflection is actually a clockwise angle. The coarse deflection scales on the M53 sight are numbered counterclockwise simply because the index is stationary — if a sight is set at 0 deflection and then the micrometer knob is turned to cause the telescope to rotate clockwise, one can see that the coarse

scale also goes clockwise and the number against the index increases.

In short, the sight is already like the aiming circle, which is why a mortar can be reciprocally laid with the sight of another mortar substituted for the aiming circle. If the sight were changed to read counterclockwise angles, then something would have to be done either to the aiming circle or to its procedures.

Most mortarmen are not even aware that the sight reads clockwise, and most would have difficulty defining deflection. This is not surprising, because the mortar manuals that discuss the sight and the aiming circle don't define deflection either. They do provide some diagrams of deflections, but these diagrams are not all drawn consistently.

For example, Figure 42 of FM 23-92 (4.2-Inch Mortar, M30) shows a mortar with an M53 sight (that is, it has two deflection scales), but it shows a deflection angle that would be measured by an M34 sight (for an M53, the reading should be 5200 mils instead of 2000). Another example is Figure 43 in the same manual, which is geometrically equivalent to the true situation but which shows angles equal to 3200 minus the actual deflection. In fact, more than half of the

diagrams in FM 23-90 (81mm Mortar) and FM 23-92 make similar errors. A mortarman who wants to know what this strange angle is must dig the definition out of paragraph 12-5a, FM 23-91 (Mortar Gunnery): Deflection is the "horizontal, clockwise angle measured from the rearward extension of the axis of the mortar tube to the line connecting the sight and a designated aiming point."

EFFECT

Nevertheless, the effect of deflection is to increase counterclockwise. The reason for this backward result is found in the way the sight and the barrel work. Angles are measured from a base (or zero) line to a reference line. Normally, the base line is fixed, while the reference line shifts. For example, when an aiming circle is oriented for reciprocal lay, its base or zero is the mounting azimuth, and it measures from that fixed base line to the reference lines of the different and shifting mortar sights. In contrast, the base line for the sight is the rearward extension of the barrel, which shifts whenever the weapon is traversed.

Consider what happens when a mortar has just been reciprocally laid, with its sight reading 2800 and the vertical hairline on the aiming posts, and the crew is ordered to shift to deflection 2900. First, the gunner refers the sight to 2900 — this moves the vertical hairline clockwise to the right. Next, he traverses left to the aiming posts — the base (the rearward extension of the tube) shifts counterclockwise, and the vertical hairline returns to its original reference line (the aiming posts). Thus, the counterclockwise effect results from a clockwise angle.

Nevertheless, Mr. Hoyle is correct in stating that renumbering the deflection scales (coarse and micrometer) in reverse would allow the mortar to lay on azimuths. Other changes would have to be made, however, and we would have to choose among several methods of doing this.

In the first of these methods, the black deflection scales (coarse and micrometer) would be reversed to read counterclockwise angles, while the red scales and the

aiming circle were left unchanged. Reciprocal lay and boresighting would not need to be changed and would be accomplished with the red scales. When reciprocal lay was complete, the telescope would be referred to the direction in which aiming posts were to be emplaced (red 2800, at present, though Mr. Hoyle suggests that we not lock ourselves into this direction), and the black scales would be slipped to read the mounting azimuth. The black scale would be used for firing, and the FDC could forget about deflections and work with azimuths. Whichever way the barrel was pointed, if the sight was on the aiming posts, then the black scale would read the azimuth of aim.

The disadvantages of this method include the fact that every mortar sight would need a deflection scale and an

azimuth scale working in opposite directions. Also, the M53 sight would lose the four ways in which the black scale can now be used.

(Incidentally, another deficiency of the mortar manuals is that they provide no coherent explanation of the black scale. They simply tell us in different places that in a certain situation we must slip the black scale and take readings from it. FM 23-91's definition of *deflection*, therefore, is incorrect for the black scale and for the M34 sight.)

In the second possible method, all sight deflection scales would be reversed into counterclockwise azimuth scales, while the aiming circle would be left unchanged and oriented for reciprocal lay in accordance with current doctrine. The gun would be set up with its 0-3200 line as



Mortar crewmen lay mortar during annual ARTEP.

at present (0 along the rearward extension of the tube). The aiming circle operator would then have to subtract his reading to the sight from 6400 to correct for the reversed sight scale. The gunner would index this difference on his sight and ask for a recheck. When each mortar was laid on the mounting azimuth, the gunner would refer to the direction in which aiming posts were to be emplaced and then slip his scale to read the mounting azimuth. Aiming posts would be emplaced, and the sight thereafter would read the azimuth of aim.

This method would require that the sight's scales be reversed and that index marks be put on the coarse scale and micrometer to allow the gunner to identify the axis of the tube. The disadvantage of this method is that the aiming circle operator would have to perform a subtraction problem for each deflection reading, and the gunner would also have one step added to his reciprocal lay procedure — slipping the scale.

In the third method, both the mortar sight and the aiming circle would be reversed to read counterclockwise angles. The aiming circle would be oriented for reciprocal lay by subtracting the declination constant from the mounting azimuth (reversing the present procedure) and then orienting on magnetic north. This would put the aiming circle's zero line on the mounting azimuth. The mortar would begin reciprocal lay with its zero line along the rearward extension of the tube, as at present. Lay would then proceed as at present until the barrel was on the mounting azimuth ("zero mils — mortar laid"). The gunner would then refer his telescope to the direction in which aiming posts were to be emplaced. The FDC would work with azimuths only, and the mortars would be laid on azimuths.

The disadvantages to this method are that both the sight and the aiming circle would have to be altered. Also, the aiming circle could no longer be used conveniently for measuring azimuths — unless it was given two scales, one clockwise and one counterclockwise. This method would be simpler than the other two.

From this, we can see that the idea of discarding deflections in favor of azi-



Crew prepares to fire.

imuths is perfectly feasible. Some retraining and equipment modification costs would be incurred, of course, but if laying by azimuth resulted in real gains, these costs should be accepted.

Let's consider, then, the advantages and disadvantages of discarding deflection, using the third of the three possible methods, since it is simpler.

The advantages would go to the FDC. Forward observers would report target locations instead of gun-to-target direction, and mortar crew members would also have no real concern with the azimuth on which their weapons were laid. But FDC training would be simplified, as the puzzling matter of deflection and deflection indexes would no longer exist. FDC procedures upon arrival at a firing position would be one step simpler

because the computers wouldn't need to mark deflection indexes, and the firing chart or plotting board would have one less set of marks on it.

The disadvantages of laying by azimuth would mostly go to the gunners. First, gunners would have one extra step in reciprocal lay. The command "Refer to 2800 and emplace aiming posts" would become "Refer to 3600, slip your scales to (the mounting azimuth), and emplace aiming posts."

Also, when a platoon went out of action, the gunners would have to be told (or have to remember) to reslip their scales so that the 0-3200 line was once more parallel to the axis of the tube. This step would be necessary to make the sights ready for reciprocal lay at the next position, and index marks (as on the M64

sight) would be needed on deflection scales so that the 0-3200 line could be identified. (If this step were forgotten, reciprocal lay would be fouled up considerably.)

Next, instruction in the geometry of the sight would be more complicated — the 0-3200 line would be along one constant orientation during reciprocal lay but afterwards would be in different directions as dictated by the mounting azimuth.

Finally, the value of the aiming circle as an azimuth measuring instrument would be considerably reduced, unless we accepted the complication of two sets of scales — one clockwise and the other counterclockwise.

I can envision a few other aspects of this question, and INFANTRY readers may think of still others, but the discussion here seems to cover the mechanics and the major *pros* and *cons* of deflection versus azimuth. I believe deflection

is simpler and therefore preferable, but the case is not overwhelming. Nevertheless, Mr. Hoyle has done us all a favor by asking us to think through an ancient procedure that we have tended to take for granted.

Major Peter R. Moore is an Infantry Reserve officer now serving as adjutant of the 11th Special Forces Group at Fort Meade. While on active duty he served as a 4.2-inch mortar platoon leader with the 8th Infantry Division. In his civilian job, he is legislative assistant to a U.S. senator.

Antiarmor Weapons in Cities

CAPTAIN FRANK A. EMERY

Because of the extensive urbanization in Western Europe, we have known for a long time that any future war there is likely to include combat in cities. The Soviets have known this, too, and have prepared for it. (See "Soviet Military Operations in Built-Up Areas," by Major A.E. Hemsley, INFANTRY, November-December 1977, pages 30-34, and "MOUT and the Soviet Motorized Rifle Battalion," by Lieutenant Colonel Lester W. Grau, INFANTRY, January-February 1985, pages 24-27.)

The current Soviet doctrine for combat in cities shows that a Soviet division will operate in two echelons at each level of command and use frontages of four to six kilometers, with two to three kilometers for a regiment, 400 to 600 meters for a battalion, and 200 to 300 meters for a company.

The divisional and regimental axes of advance will be along major roads so that these units can capture key areas, disrupt the defense, and cross the area in the shortest possible time. A battalion might

advance on two or three parallel streets, with one company axis per street.

During offensive combat in cities, Soviet artillery will be decentralized. Up to half of it may be attached to assault

groups and used in its direct fire role. Howitzers and mortars will be used for counter-battery tasks. Preparatory fires will be shorter than normal, 5 to 20 minutes usually. Tanks will be used to sup-



TOW crew prepares for a shot during training with the Berlin Brigade.

port infantry and to neutralize enemy strongpoints. Soviet doctrine calls for strong reserves of tanks at both battalion and regimental level.

Clearly, then, if our infantry units are to have an advantage in combat in cities, we must have some efficient means of getting firepower into the killing zone from all sides, especially from the flanks. But our current antitank weapons have certain limitations that may make them ineffective in city streets.

First, antiarmor ranges in city streets will not usually exceed 1,000 meters. Although our light antiarmor weapon (LAW) has the appropriate range, its ability to penetrate Soviet armor is questionable. (The AT-4 may do somewhat better in this regard.) Conversely, the TOW and the Dragon have proved that while they can destroy Soviet tanks on a conventional battlefield, they may not be as effective in cities because they cannot take on targets at short ranges. In addition, both of these weapons are antitank guided missiles (ATGMs), and the tracking distances will be limited; there is little open terrain in cities where a gunner can track a target for the required 5 to 16 seconds.

There are other limitations to using ATGMs in cities, primarily because of the numerous obstacles found there. One of the most overlooked of these is electric power lines. In the Federal Republic of Germany, for instance, voltages in power lines range between 8,000 and 100,000 volts, and TOW guidance wire is insulated to withstand only 100 volts. High voltages can induce currents in a TOW guidance wire, and while they might not break the wire immediately, they can melt the wire's insulation and

flow back to the gunner and the TOW vehicle. Even the best electrical ground can reduce this voltage by only a fraction. Obviously, such voltages can cause serious injury to a gunner and serious damage to the ground equipment.

Another obstacle for TOW and Dragon gunners is the tank barriers that we will probably emplace along the armor avenues of approach. An abatis is such a barrier. For an abatis to be effective, the stumps in it must be 5 feet high, the tree length 20 feet, and the barrier depth 250 feet. Such a barrier will decrease the effectiveness of an antitank gunner because it will interfere with his target sight and cut the wires to the missile. Triple-strand concertina wire that stands over 5 feet high can also cut TOW and Dragon wires.

ENGAGEMENT

The urban environment itself provides a substantial obstacle, because it forces the gunners to engage armor targets from the front. Frontal engagement is not recommended, because a gunner's position can be more easily identified by his weapon's backblast. Also, the mobility of the TOW systems could be seriously limited because of the debris created by indirect fires. Finally, urban conditions may not permit a TOW system to engage its target from a mounted position, and when TOWs have to be dismounted, the heavy equipment will burden the crew and greatly reduce its mobility.

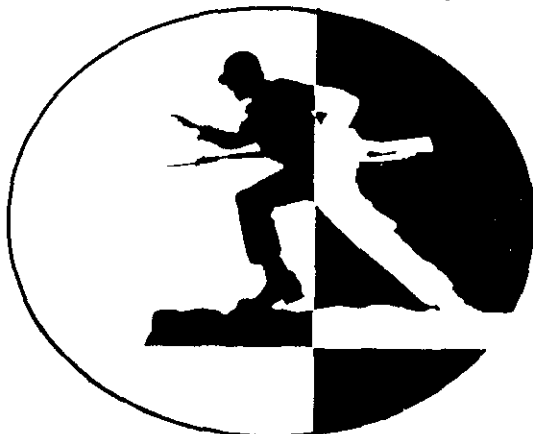
Another problem with our antiarmor weapons is that we overlook the importance of conducting tactical training with them. For some time, we have empha-

sized tracking with the TOW using the M70 training set while placing little or no stress on training in tactical skills. (This emphasis on tracking seems to stem from the fact that the M70 trainer generates numerical scores that can be used to separate good TOW gunners from bad ones. Tactical training, on the other hand, is hard to evaluate — especially when an individual does not understand the expected level of warfare, the threat, and the common engagement situations to be trained for.)

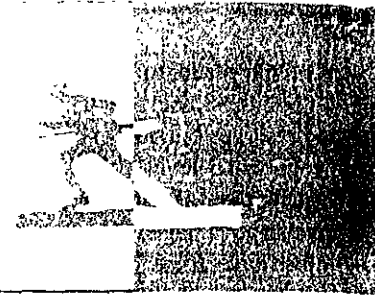
The Soviets recognize that close combat is one of the most characteristic features of action in a city and that it requires a special organization of their system of fires. The chief role in that system is played by the infantry with its small arms and grenades supported by armored vehicles and mobile artillery. Accordingly, to counter the Soviet offensive threat, we must develop a multilevel and multi-layered field of fire over the entire terrain in front of a defended object as well as within buildings.

In recent years other nations have been making improvements in their close-range antiarmor weapons. We, too, must recognize their importance and come up with an alternative to our current weapons. We can either develop such an alternative ourselves or adopt a weapon developed by one of our allies. Either way, we must give our infantrymen a weapon they can use effectively in urban warfare.

Captain Frank A. Emery recently completed the Infantry Officer Advanced Course and is now assigned to the 2d Infantry Division in Korea. He previously served with the 502d Infantry in the Berlin Brigade



ENLISTED CAREER NOTES



THIRD-YEAR DRILL SERGEANT PROGRAM

Any drill sergeant who is considering extending for a third year should make sure he understands what he will get in return for that third year. His decision should be based upon a sincere desire to continue in the drill sergeant program, not on the possibility of a choice of assignment upon completion of that duty.

AR 614-200, paragraph 8-22b states: "Soldiers who extend their 24-month tour of drill sergeant duty for an additional 12 months will, on completion of a 36-month tour of drill sergeant, be reassigned to the location of their choice provided a valid requirement exists at such location." The key part of that sentence is "provided a valid requirement exists at such location." In short, no requirement, no assignment.

When the third-year drill sergeant's career management individual file (CMIF) is returned to his branch, ten months before the end of this stabilization, his preferences will be compared with the existing requirements. The reporting date for the new assignment must be compatible with the end of the drill sergeant stabilization, and the soldier must be qualified for that assignment.

When a drill sergeant requests the extension for the third year (using DA Form 4187), he should list on the form his three locations of preference. If he asks for Hawaii, Japan, and Fort A.P. Hill, however, he will not get any of his preferences. At this point, his assignment will be considered from his DA Form 2635 (Enlisted Preference Statement) and what is available that will provide him with professional development.

When selecting choices for his next assignment, he should make sure they are realistic. An 11B has a better chance of being assigned to Fort Ord or Fort Benning than he has of going to Fort Benjamin Harrison or Fort Huachuca or any

other installation that is authorized only a small number of 11Bs. This also pertains to overseas areas.

One other consideration should be the time since his last overseas assignment. If the soldier is eligible for overseas service and selects a stateside location, he may be there for only the one-year period he picks up as the PCS stabilization.

ENLISTED STANDBY ADVISORY BOARDS

Selection for promotion is an area that can be severely affected by errors in the records a promotion selection board reviews. To remedy this situation and to make sure all NCOs are treated equally and not penalized either by their own errors or by errors in the maintenance of their files, the Army conducts Enlisted Standby Advisory Boards (STABs).

These boards are convened at MILPERCEN's Enlisted Records and Evaluation Center (EREC) at Fort Benjamin Harrison, Indiana. They consider soldiers whose files either did not appear before a recent board because of administrative error, were found to contain documents that the board should not have seen, included someone else's documents, or were missing documents that should have been there.

These boards are scheduled about six months after the annual selection board for a given rank. A combined board for selection to master sergeant and sergeant major is held because of the few records that appear before the board. It is normally scheduled to convene each year in February. The sergeant first class board is scheduled for each June.

In addition to these two boards, others are held throughout the year in conjunction with the regular promotion boards. These other boards consider NCOs for promotion to sergeant first class, master sergeant, and sergeant major, and are

held in October, March, and July.

Before an NCO can be considered for a STAB, certain criteria must be met and specific procedures must be followed as detailed in Paragraph 7-44 of AR 600-200.

The first category considered for STAB is made up of files that were within the established zone (primary or secondary) of a previous selection board but were not considered. (This is the only time NCOs in the secondary zone are eligible for STAB.)

The second category is made up of files submitted for reconsideration because they contained major errors when they appeared before a promotion board. (MILPERCEN will determine whether a file contained material errors. Errors are considered material when there is a reasonable chance that the soldier might have been selected for promotion if the error had not occurred.)

Any request for an NCO's records to appear before a standby advisory board must be submitted through his chain of command to the servicing MILPO for evaluation to make sure his case meets the criteria. The case is then forwarded by the MILPO to MILPERCEN, (DAPC-MSP-E), Alexandria, VA 22332-0400.

BFV INFANTRYMEN

The transition from MOS 11B to 11M continues, but the Enlisted Master File (EMF) is not being updated quickly and thoroughly enough to keep soldiers with MOS 11M going to the right places. This creates several problems: The Army cannot effectively use the unique skills the Bradley Fighting Vehicle infantryman has; units that need BFV infantrymen remain short of soldiers with needed skills; and the individual soldiers suffer from not being assigned to a position where their skills can be kept current.

If your PMOS is 11M and you have

been notified that you are on assignment instructions to move to another location, you should double check during your levy to make sure the MOS required for the assignment is 11M. If you are being assigned to any other MOS requirement (with the exception of drill sergeant duty), you need to immediately bring this to the attention of the personnel there. A phone call to your career advisor or assignment manager at MILPERCEN is usually all it takes to verify the assignment instructions.

Remember, you are promoted and selected for higher level schooling on the basis of your potential, and one of the best indicators of potential is solid performance in a TOE unit within your primary MOS.

HOMEBASE/ADVANCED ASSIGNMENT

Many questions are directed to the Infantry Branch concerning eligibility for the Homebase/Advanced Assignment Program (HAAP).

Enlisted personnel in the ranks of sergeant and above (except for sergeants major/command sergeants major and promotable master sergeants/first sergeants) stationed in CONUS who are assigned overseas to *dependent-restricted* 12-month short tours will be informed of their next assignment before leaving CONUS. When possible these soldiers will be returned to the place of prior assignment.

Members of COHORT (cohesion, operational readiness, and training) units

under the new manning system who are deployed overseas for unaccompanied 18-month long tours may voluntarily elect a homebase assignment. Advanced assignment to CONUS will also be given to members in those grades who go from an overseas long tour to a dependent-restricted 12-month short tour.

A specialist-4 who is on a promotion list, in receipt of assignment instructions, and promoted to sergeant before departing from his losing duty station will be given a HAAP assignment. A specialist-4 who is on a promotion list to sergeant, but who is not to be promoted until after he arrives in the short-tour area, is eligible for a HAAP assignment. He should initiate a DA Form 2635 preference statement about 10 months before his scheduled DEROS (date eligible to return from overseas).

A soldier who is assigned to an accompanied tour and voluntarily elects to serve a 12-month "all others" tour is not eligible for a HAAP assignment.

Hawaiian residents may be given HAAP assignments to Hawaii. CONUS residents and residents outside the contiguous forty-eight states, less Hawaii, will not be involuntarily homebased in Hawaii.

A request for a change of HAAP submitted by a soldier currently serving in a short-tour area will normally be disapproved, but exceptions will be reviewed on a case-by-case basis when submitted by the soldier to the Infantry Branch.

Soldiers who already have HAAP assignments but elect to extend their foreign service tours will normally be reassigned to their original HAAP assign-

ments provided a valid requirement exists at the original location of the approved HAAP. If there is no valid requirement at that location, the soldier will be reassigned to a location in CONUS where one exists.

Soldiers serving in a dependent-restricted short-tour area who are selected to attend the Sergeants Major Academy upon their return to CONUS and who have previously been given a HAAP assignment will no longer be eligible for that assignment. If these soldiers decline attendance, however, they will be reassigned to their originally approved HAAPs upon their return to CONUS.

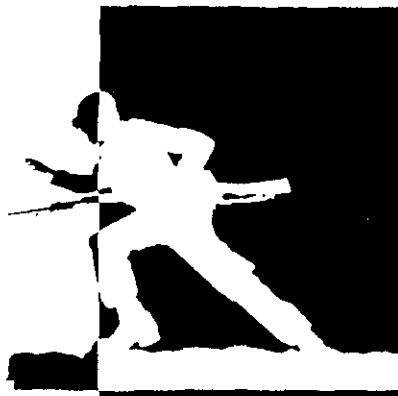
Soldiers who are qualified parachutists (SQI "P") will be provided a HAAP assignment to installations that are authorized parachutists, except when assignments exceed parachute-qualified soldier requirements at the installation.

Although Infantry Branch will make every effort to honor all HAAP assignments, these assignments may be changed as necessary to meet the needs of the Army.

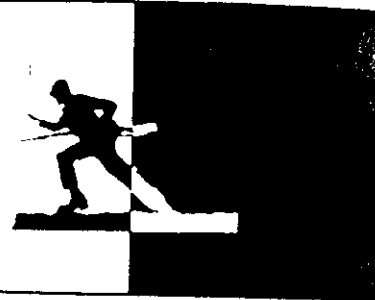
UPDATE TO AR 27-10

An upcoming revision of AR 27-10 will reflect the elimination of the 1 November 1985 cutoff date for petitions to move old Article 15s from the performance (P) fiche to the restricted (R) fiche in your official military personnel file (OMPF).

The previously used procedures will remain in effect until the update has been distributed to the field.



OFFICERS CAREER NOTES



INFANTRY EDITORS GOOFED

In this section of INFANTRY's January-February 1986 issue, an item on graduate degrees for officers indicated that ROTC instructor duty makes it easier for an officer to get an advanced degree. This is in error and came from a 30 August 1985 MILPERCEN news release that was corrected a few days later.

Many Infantry captains and field grade officers have opportunities to serve as assistant professors and professors of military science at universities throughout the United States. The principal responsibilities of ROTC duty include preparing and conducting college level classes, recruiting, supervising ROTC cadets in leadership duties, and counseling students on academic, military, and personal matters. A critical responsibility involves serving as an effective role model on campus to help foster a positive image of the military profession.

Officers who are eligible for ROTC duty should not view the assignment as a likely avenue to an advanced degree. The broad scope of responsibility as a leader and instructor normally precludes enrollment in graduate classes.

ROTC duty gives infantry officers an opportunity to enhance their leadership skills and to help develop the future leaders of our Army. The nomination process normally begins around September of each year with a report date the following July. Officers who are available and interested should contact their assignment officers in July or August.

COL GARY A. SORENSEN
Public Affairs Officer
MILPERCEN

MILITARY QUALIFICATION STANDARDS

Military Qualification Standards (MQSs)

have been developed and are now being implemented in the Army. These standards are designed to provide a training strategy for officers from their pre-commissioning through their tenth year of military service.

Cadets in ROTC and at the U.S. Military Academy and officer candidates at the Officer Candidate School at Fort Benning receive training under MQS I. Lieutenants generally receive MQS II training, and captains MQS III.

The MQS system places the responsibility for personal competence on the shoulders of the individual officer. Army trainers have determined what an officer must be able to do, and they provide training so that each officer can perform in a particular branch and at the appropriate level. The field commander serves as a mentor, providing an environment in which a young officer can develop.

MQSs are made up of two components—military tasks and knowledge and professional military education.

The military task and knowledge component of MQS I trains cadets in the basic soldier and leadership skills a lieutenant must have when he is commissioned. These skills provide a foundation for the additional leader and branch skills that will follow.

The professional military education component of MQS I requires the following:

- A baccalaureate degree, including three mandated courses (in written communication, human behavior, and history). In addition to these mandated courses, studies in management and national security affairs are recommended. (Lieutenants commissioned through OCS may defer this requirement for up to 10 years.)

- Mastery of tasks and subject areas. Cadets receive an MQS I manual that presents 64 tasks and 19 military subject areas. The manual presents its contents

in the familiar "task, condition, standard" format.

So that precommissioning training can be standardized, each task and military subject is supported by a training support package. For instance, a package of instructional materials goes to each senior ROTC institution. Every Professor of Military Science has the same lesson plan for tasks and subject areas. This helps to standardize precommissioning training while giving the PMS ways of adjusting training to the cadets' capabilities and needs.

To be recommended for commissioning, a cadet must qualify on all military skills and professional knowledge subjects. The Professor of Military Science certifies MQS I completion.

MQS I is now being phased into all precommissioning training. The USMA and ROTC implemented MQS I in the 1982 school year, and in the 1986 school year, all graduates will be certified in MQS I. OCS at Fort Benning has been using MQS I since January 1984.

Unlike MQS I, MQS II will be a branch-specific program. Each branch school will develop its own MQS II manual to give lieutenants a picture of where they are professionally and of how they can improve their skills.

MQS II builds upon MQS I, with more advanced military task skills and professional education components. The manuals consist of a common task element and the branch manuals.

The common task manual portrays the tasks all lieutenants must be able to perform. Branch-specific manuals outline the training strategy for each branch, providing information on tasks trained in resident courses and at the individual officers' units.

Four TRADOC schools (Infantry, Field Artillery, Military Police, and Missile and Munitions) conducted a year-long evaluation of the MQS II manuals. Each school analyzed the job

requirements for lieutenants assigned to their branches and identified critical tasks performed in various duty positions.

An MQS II field evaluation was conducted from November 1982 to November 1983. Lieutenants in the participating units used the manuals to train in and perform selected tasks. Feedback from this field test was used in planning for the Armywide MQS II, which was approved in July 1985. MQS I was also approved as it is presently conducted.

MQS II, which is to be implemented during Fiscal Year 1987, will serve as a professional development tool and a training guide for junior officers and their commanders. They will form a partnership that will work to foster professionalism in every unit.

Lieutenants will use the MQS II manuals to help them attain and maintain task proficiency. Commanders will use them to identify the specific training needs of their lieutenants. In this manner, the lieutenant and his rater will be able to work together in setting the goals reflected in the lieutenant's OER support form (the new DA 67-8-1).

These goals may come from the task lists and reading lists presented by the MQS manual, and this is where the

"mentor" function comes into play. The MQS system helps leaders fulfill their roles as mentors by focusing on precise branch or common tasks the young officer needs to perform effectively in a particular duty position.

Just as MQS II was tested before being implemented, MQS III is undergoing a similar process. The results of the MQS III tests are expected to be available soon.

WARRANT OFFICER TRAINING SYSTEM

The Warrant Officer Training System (WOTS) is being implemented with branch participation at every step. The three-year-old system has given the Army's warrant officer corps the standardized training structure it previously lacked.

The system will include three phases—pre-appointment, advanced, and senior. The plan also calls for two certification processes. The first of these consists of Technical Certification Task Lists and Technical Certification Diagnostic Examinations by MOS. These lists and examinations will apply mainly to warrant officer candidates. The idea is to determine what tasks are critical to a certain

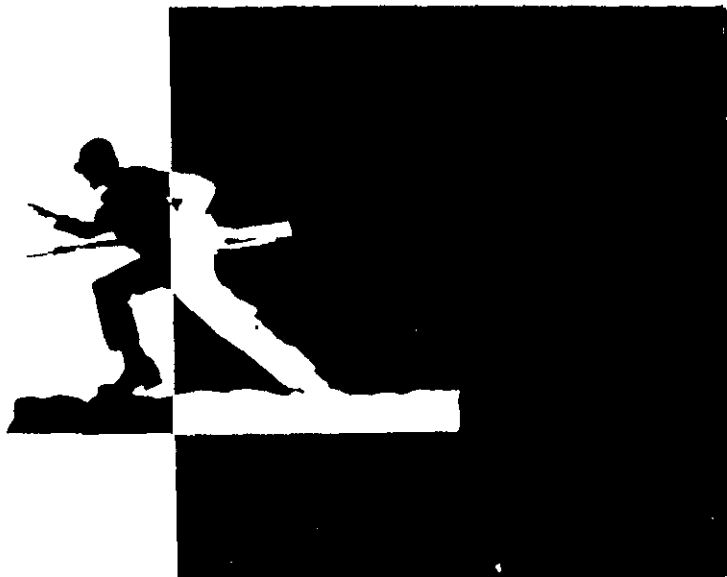
MOS and measure how well a person can perform those tasks according to a set of standards.

Initial certification will probably be conducted by MOS proponents during the training part of each phase, with MOS verification by commanders during the utilization part.

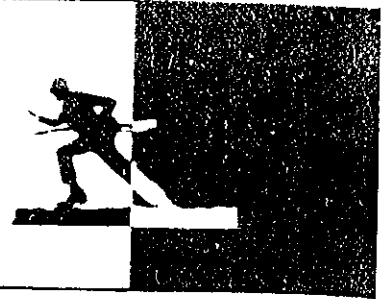
The 30-Year Career Plan approved by the Army provides a general, MOS-immaterial plan for all warrant officers. It outlines the training, utilization, and certification periods in the warrant officer, senior warrant officer, and master warrant officer career phases established by the Army.

Plans have been outlined for the system's third career phase, now called Master Warrant Officer Training, since the Army established a requirement for MWO slots in each warrant officer MOS. Once MWOT has been fully implemented, MWO slots can be filled by graduates at the warrant officer-4 level. Later, they may be filled at the new rank of warrant officer-5, pending approval of that grade.

The Warrant Officer Training System is a case of warrant officers helping to solve the problems of the corps themselves, with Total Army involvement and constant feedback right to the top.



BOOK REVIEWS



In this issue we would like to call your attention to a number of excellent reference works that have recently come our way:

• **THE CHALLENGE OF COMMAND: READING FOR MILITARY EXCELLENCE**, by Roger H. Nye. Avery Publishing Group, 1986. 187 Pages. \$9.95, Softbound. After giving his thoughts in separate chapters on such subjects as the challenges of a commander, the commander as tactician, the commander as moral arbiter, and the commander as mentor, the author, a retired U.S. Army officer, lists at the end of each chapter books he considers pertinent to the subject under discussion. He includes works of fiction, the chief one being Anton Myrer's *Once An Eagle*. (The shortest list of all — 12 titles, of which 3 are fiction — follows Nye's chapter on the commander as moral arbiter.) He also includes a list of "first books for officers who are to become readers," a good bibliography, and an index. All Infantrymen should read this book.

• **U.S.-SOVIET MILITARY BALANCE, 1980-1985**, by John M. Collins. Pergamon-Brassey's, 1985. 360 Pages. \$50.00. This is not John Collins' first such effort; an earlier work dealt with the same subject, but for the 20-year period between 1960 and 1980. That study, as this one, was commissioned by members of the United States Congress, senators and representatives.

Collins, a retired U.S. Air Force officer who now serves as a senior specialist in national defense matters at the Library of Congress, has become an acknowledged expert in comparing U.S. and Soviet war-making abilities. This book, like his previous one, uses several hundred pages of tables, charts, graphics, and statistics to buttress Collins' main arguments. There is no publication in the unclassified realm that remotely compares with this one. He pulls no punches

and lets the chips fall where they may.

• **STRATEGIC DEFENSES**, by the Office of Technology Assessment. Princeton University Press, 1986. 475 Pages. \$12.50, Softbound. Here is another publication based on a U.S. Government study, this one also prepared for the U.S. Congress, as was John Collins' report. The original reports—there are two of them—were made public in September 1985 and printed separately by the Government Printing Office in a limited quantity. In this volume, the Princeton University Press has brought both reports under one cover and has made them widely available to the general public.

The reports were prepared by the Office of Technology Assessment, an office created in 1972 to serve as an analytical arm of Congress. As such, the office provides Congress with independent and timely information about the potential effects of technological applications. The two reports here gathered together are *Ballistic Missile Defense Technologies* and *Anti-Satellite Weapons, Countermeasures, and Arms Control*. In short, the reports outline the political, military, and technological controversies concerning the present highly publicized strategic defense initiative (SDI) and present an assessment of a wide range of strategic criteria. In reality, both reports provide more questions than answers, and while they are certainly not the easiest things to read, all Infantrymen should make the effort to read into the problem and to become more familiar with a program that may seriously affect their future military roles.

• **AMERICAN DEFENSE ANNUAL, 1985-1986**, edited by George E. Hudson and Joseph Kruzell. Mershon Center, The Ohio State University. Lexington Books, 1985. 277 Pages. \$23.00. This is the first of a planned annual series on U.S. defense matters, and all Infantrymen should become familiar with it, because there is no other publication that

devotes itself exclusively to U.S. security policies and problems. There are 11 separate essays in this book prepared by 17 different authors; the essays cover such diverse subjects as arms control, the defense budget, defense strategy, and low intensity warfare. The book also has a 1984 chronology, a 1984 defense bibliography, a list of U.S. security commitments in 1985, and an index.

• **MILITARY MOTORCYCLES**, by David Ansell. David and Charles, 1986. \$28.00. The author is a motorcycle enthusiast and historian in addition to being a freelance designer and artist. In this book, Ansell presents 102 motorcycle models from around the world that he feels best represent the development of the military motorcycle from 1904 to the present. Each model is accompanied by a detailed drawing done by the author, a concise history, and technical specifications. (Eight of the models are from the United States.) He also offers a table of specifications of more than 300 military motorcycles that date from 1904. Ansell says his study is not a definitive one, but there is little question it includes the principal models that have been adopted.

• **ATLAS OF GLOBAL STRATEGY: WAR AND PEACE IN THE NUCLEAR AGE**, by Lawrence Freedman. Facts on File, 1985. 192 Pages. \$22.95. The author is a professor of war studies at King's College London. This is his fourth published book and in it he tackles such subjects as the changing international order, warfare since 1945, the nuclear arms race, and conventional war. He writes easily but authoritatively, and each of his major subdivisions is profusely illustrated with splendid maps, black-and-white and full-color photographs, and numerous other graphic features. He feels that after all is said "it is prudent statesmanship upon which we must rely if the most awesome of the many engines of war that we have described are not to be set in motion."

• **AIR DEFENSE ARTILLERY**, compiled by Janice E. McKenney. Army Lineage Series. Center of Military History, United States Army, 1985. 429 Pages. GPO S/N 008-029-00130-6. \$27.00. This, the latest volume in the Army Lineage Series, contains the lineages and honors of the 24 Regular Army and 5 Army National Guard air defense artillery regiments in the force structure at the end of 1982. Each entry also has a colored illustration of the regimental coat of arms and distinctive insignia, a description of the heraldic items, and a regimental bibliography. Janice McKenney is the supervisory historian in CMH's Historical Services Division.

• **POCKET GUIDE TO THE WORLD**, by Bernard Stonehouse. Facts on File, 1985. 512 Pages. \$18.95. It was the author's intention to design a pocket size book that "would serve other armchair geographers, provide a quick reference book for businessmen and travelers, and perhaps serve as a sourcebook for students, teachers, journalists, TV presenters, and others with similar needs." His book does those things, and perhaps more. Certainly it can be a welcome addition to any personal library.

• **ABOVE AND BEYOND: A HISTORY OF THE MEDAL OF HONOR FROM THE CIVIL WAR TO VIETNAM**, by the Editors of Boston Publishing Company in cooperation with The Congressional Medal of Honor Society. Boston Publishing Company, 1985. 346 Pages. \$39.95. This lavishly illustrated book combines pure history and pages of statistics with essays and high personal accounts to present a comprehensive story of the Medal of Honor, America's highest award for military valor, of which 3,412 have been awarded to 3,394 recipients since it was instituted in 1861. (The difference is accounted for by the fact that there have been a number of double awards.) It is interesting to note that beginning with World War I most of the awards have been made posthumously. The book also has a complete register of the recipients, a most useful bibliography, and a general index.

• **THE SPRINGFIELD 1903 RIFLES**, by William S. Brophy. Stackpole Books, 1985. 616 Pages. \$49.95. This book, a collector's dream, is said to be "the illus-

trated, documented story of the design, development, and production of all the models, appendages, and accessories" of the Springfield 1903 rifle. It is certainly that, and is one of the outstanding reference books of 1985. The author is a retired U.S. Army Reserve officer who has four other published books — three on small arms — to his credit. He has used and collected Model 1903 rifles for many years and points out that the rifle is now "a desirable military collector's arm the world over." The book also contains numerous photographs (one of the author with an '03 rifle taken in 1934), drawings, and tables. There is also a useful bibliography and an index.

• **THE NCO GUIDE** (Second Edition), by Dan Cragg. Stackpole Books, 1986. 310 Pages. \$14.95, Softbound. This guide was preceded by *The Noncom's Guide*, which was published in 21 editions and written by Charles O. Kates. Now, Dan Cragg, a retired U.S. Army Sergeant Major, has collected up-to-date information from many military sources to provide today's noncommissioned officer with guidelines for every official and social situation. Numerous photographs, line drawings, and charts are included, and new illustrations detail the latest uniform changes. This is an excellent source of information for the Infantry NCO.

Here are a number of other books we think you should know about:

• **SOVIET ARMED FORCES REVIEW ANNUAL, VOLUME 9, 1984-1985**. Edited by David R. Jones (Academic International Press, 1986, 313 Pages). Reviewed by Major Don Rightmyer, United States Air Force.

This is an outstanding annual series in that it provides an authoritative analysis of the Soviet military establishment.

The editor of this ninth volume in the series, David Jones, sets the stage for the book with a 35-page introduction that provides a broad overview of the significant events in the USSR's military development during 1984-1985. He discusses the early effects of Mikhail Gorbachev's assumption of power as well as the numerous changes within the Soviet military leadership ranks during the period under review. This introduction is complemented by an in-depth statistical

analysis that documents up-to-date data on such subjects as weapon system levels, unit strengths, and listings of senior Soviet military leaders.

More than half of the book consists of reviews of significant trends and changes in the five arms of the Soviet armed forces (strategic rocket forces, ground forces, air defense, air forces, and navy) as well as the Soviet economy, the Far East, and the Soviet space program. The book's strength as a reference source is reflected by some 85 maps and numerous tables and charts that help clarify the written narratives.

The book concludes with three chapters on special topics and a comprehensive bibliography. It is one of the best reference handbooks available on the Soviet armed forces.

DEAR AMERICA: LETTERS HOME FROM VIETNAM. Edited by Bernard Edelman (Norton, 1985. 316 Pages. \$13.95). Reviewed by Doctor Joe P. Dunn, Converse College.

No one knows how many pieces of personal correspondence flowed in and out of Vietnam during the long years of the war, but one thing is certain — mail was the most important element in each serviceman's life. And the letters collected here, examples of the vast correspondence, probably capture better than any other source the thoughts, fears, and hopes of the ordinary soldier.

In response to a public appeal by the New York Vietnam Memorial Commission for materials from veterans, over 600 individuals submitted Vietnam correspondence — a total of some 300 pieces. For this volume, 208 pieces written by 125 different people were chosen. Admittedly the letters were edited to eliminate repetitions, private, and tangential information, to correct and regularize spelling, and to indent paragraphs. But the authenticity and power remain.

The letters capture many of the myriad aspects of the Vietnam experience at the different times, places, and conditions of the war. And they reflect the lives, experiences, and concerns of ordinary soldiers whether in the field or in the rear areas. The common thread is that all these young men and women, far from

home, were striving to convey some sense of their reality as they saw it.

The letters are grouped by subject, and after each piece the editor lists the writer, his unit, dates of tour, and his present position today. Many of the letters are particularly poignant because the author did not return alive.

This may not be the most profound book in print on Vietnam, but it is one of the more real and captivating.

MILITARY DOCTRINE AND THE AMERICAN CHARACTER: REFLECTIONS ON THE AIRLAND BATTLE. By Herbert I. London (National Strategy Information Center, 1984. 67 Pages. \$4.50.) Reviewed by Colonel James B. Motley, United States Army Retired.

In this succinct study the author writes that "victory on the battlefield is partly a function of how we [U.S.] prepare to fight. This highly abstract process . . . must be made concrete through a discussion of strategic, operational, and tactical issues. That cannot be done through quantitative analysis alone . . . It requires observation, evaluation, and recommendations."

With these comments serving as a basis for his study, Herbert London — Dean of the Gallatin Division, New York University, and Senior Fellow at the Hudson Institute — examines the modifications in training and doctrine that have been introduced by the U.S. Army for contemporary combat conditions. His analysis, as the title of the study implies, focuses on the maneuver warfare ideas in the current AirLand Battle doctrine and evaluates the computerized training procedures that have been designed to implement that doctrine. He also considers the broader relationship between national interests and military strategy.

Perhaps the strength of this book is in the author's ten recommendations, which are based "on the belief that the text of Field Manual 100-5, in its latest iteration, is the most desirable direction for the U.S. Army to take for its doctrinal guidelines and training procedures." But he warns, "There is no set of principles fully applicable across the entire spectrum of conflict. None can assure victory in battle." As Clausewitz noted, "As soon

as preparations for a war begin, the world of reality takes over from the world of abstract thought."

This informative, well-written book will appeal to the serious student of national security.

GOING TO WAR WITH JAPAN, 1937-1941. By Jonathan G. Utley (University of Tennessee Press, 1985. \$19.95). Reviewed by Captain Randy Jay Kolton, United States Army.

Since that fateful day in December 1941 when Japan bombed the U.S. fleet at Pearl Harbor, historians have attempted to unravel the military, political, and diplomatic considerations that induced Japan's leaders to support the attack and to explain why U.S. political and military leaders were so unprepared for it.

Claims of conspiracy in the U.S. leadership ranks abound, with the advocates of those claims seemingly unwilling to accept the explanation that those leaders blundered badly while trying to do their jobs to the best of their abilities. If one discards the conspiracy theories and accepts the premise that the U.S. military and political officials in 1941 were among the brightest and most talented of their age, then other considerations must be examined. Jonathan Utley does just this in his meticulous examination of Secretary of State Cordell Hull's handling of U.S. policy toward the Far East and of the activities of the various executive agencies in the U.S. Government to show why and how U.S. and Japanese relations deteriorated and why Japan's leaders eventually felt compelled to attack the United States.

Central to Utley's discussion is Hull, the aging Tennessean devoted to Wilsonian ideals and to free trade. Throughout the 1930s, President Franklin D. Roosevelt permitted Hull a free hand in overseeing U.S. foreign policy in Asia. With his associates in the State Department, Hull hammered out policies that were designed to protect the open door in China, preserve U.S. commercial interests in the region, and project a U.S. presence in the Far East.

Still, State Department officials disagreed on how to respond to Japanese aggression and on how to use U.S. mili-

tary forces and economic sanctions to compel Japan to accept U.S. demands for equality of economic and political opportunity in Asia.

By concentrating on Hull and the State Department, Utley incorrectly relegates Roosevelt to the role of a mere observer of developing U.S. foreign policy in the Far East. Although the President was certainly ambivalent regarding this country's policy toward Japan throughout this period and was sensitive to swings in public opinion, he still made the critical decisions that influenced the direction and outcome of U.S. Far East policy. Utley also minimizes the contributions of presidential advisors such as Henry Morgenthau and Harold Ickes. In addition, he inadequately conveys the fact that faulty assumptions contributed to grave errors in judgment on the part of administration officials and influenced Japanese leaders to undertake the risky assault at Pearl Harbor.

Despite these shortcomings, Utley makes a valuable contribution to the historiography on the causes of the war between Japan and the United States, and he vividly describes the complexities of U.S. foreign policy during the late pre-war period. Military history buffs, historians, and students of World War II should find this book enormously useful.

GERMAN MILITARY INTELLIGENCE, 1939-1945, by the Military Intelligence Division, U.S. War Department (University Publications of America, 1984. 321 Pages. \$29.50). Reviewed by John Carroll, Silver Spring, Maryland.

Now at last, some 40 years after the end of World War II, there appears an authoritative and informative study on German World War II military intelligence. Actually, shortly after the end of hostilities, Allied and U.S. intelligence officers had prepared two classified reports on the German intelligence efforts, and it is those studies that form the core of this volume. The Defense Department eventually declassified this material and the publisher has brought it out as a volume in its Foreign Intelligence Book Series under the editorship of Thomas Troy, the Author of *Donovan and the CIA*.

The work covers the organization and operations during World War II of I-C, German Military Intelligence, the equivalent of G-2 in the U.S. military establishment. It was part of the *Oberkommando des Heeres* (Army High Command), and its two main components were *Fremde Heere Ost* (Foreign Armies East) and *Fremde Heere West* (Foreign Armies West). There are enlightening insights into I-C's relationship with other components of the Nazi German intelligence and security community, especially the *Abwehr* (the military secret service) and the *Sicherheitsdienst* (SS), the main political information group in the Third Reich.

Even today these studies have a certain relevance to current world problems, in addition to being of considerable historical interest. It is apparent from reading between the lines that German General Reinhard Gehlen and his men of *Fremde Heere Ost* willingly presented to the victors much of the intelligence in these studies. In effect, Gehlen and his men were working their way over to the West by revealing their information on the Soviets.

This book also contains some good organizational charts, flow charts, and maps, as well as some poorly reproduced ones. The conclusions drawn from these by the Allied intelligence people indicated that the Germans had good organization,

numerous qualified personnel, and practical operations. On the other hand, there was a lack of central control and evaluation, little direction, a haphazard appreciation of reports, and a considerable amount of internecine fighting at the top in the Fuehrer's headquarters.

THE ROOT, by Eric Hammel (Harcourt Brace Jovanovich, 1985. 426 Pages). Reviewed by Doctor Mike Fisher, University of Kansas.

Eric Hammel's recent historical narrative records in detail the U.S. Marine deployment at Beirut International Airport from August 1982 to February 1984. The book, whose title comes from the Marine name for Beirut, focuses on the impressions of the Marine participants. Hammel does introduce other factors in the complex, multidimensional situation, but only as they impinge on the beleaguered Marines, and then only from their viewpoint.

Hammel interviewed more than 200 Marines concerning their experiences in Lebanon. He received the full cooperation of the Marine Corps, and although he deals sympathetically with the Corps, he sharply criticizes the U.S. State Department, the U.S. Defense Department, and the press corps for their actions in Beirut.

Veteran Infantry commanders will

relate to the difficulties the Marines experienced with tactical restraints and rules of engagement. Junior leaders can profit from the descriptions of small unit leadership in an environment characterized by imprecise definitions of objectives and long periods of inertia ruptured by frenetic activity. Many will be surprised by the intensity of combat with the Moslem militia that the Marines experienced during their deployment.

The reader turns from this work with the hope that the quality of our nation's strategic planning matches the characteristic excellence of courage and resolve demonstrated by the officers and men who serve on the cutting edge of foreign policy.

TEN DAYS TO DESTINY, By G.C. Kiriakopoulos (Franklin Watts, 1985. 408 Pages. \$18.95). Reviewed by Major John C. Edgecomb, United States Army.

As a result of his extensive travels, research, and personal interviews, the author produces what could be one of the finest documented accounts of any World War II battle. He presents a vivid portrayal of the actual fighting and battles on Crete in 1941 and adds the concerns, considerations, and decisions of the higher commands on both sides. It is, in short, a meticulous accounting of the battle for Crete.



Infantry

A PROFESSIONAL JOURNAL FOR THE COMBINED ARMS TEAM

The author's in-depth and detailed accounting of the battle thoroughly examines and addresses the German, British, Greek, and Cretan civilian involvement in the campaign. His is a well written and extensively documented book that develops quickly and holds a reader's interest throughout. It is worthy of the Infantryman's time and attention.

NOT OVER BY CHRISTMAS: NATO'S CENTRAL FRONT IN WORLD WAR III, by E. Dinter and P. Griffith (Hippocrene Books, 1983. 178 Pages. \$17.95). Reviewed by Major General Albert H. Smith, Jr., United States Army Retired.

Elmer Dinter, a colonel in the West German Army, and Paddy Griffith, a lecturer in military history at the Royal Military Academy, Sandhurst, are convinced that any future war in central Europe can be "finished quickly and by conventional means." Then, they continue, the "boys could be home by Christmas." But they also feel that a long war is in many ways the most likely of all possible scenarios, given the present state of preparations on both sides.

The authors minimize the probability of nuclear and chemical war, and, as a result, propose certain doctrinal and organizational changes they feel would improve NATO's conventional battle

posture. To them, NATO "must arm herself with enough conventional forces to remove the fear of defeat on the ground" and must create "a true operational reserve that would be capable of launching a counter-offensive of sufficient strength to regain freedom of action. That reserve is lacking at the present.

A large number of maps, charts, and diagrams do much to improve the book's value to those individuals involved in the development of war plans and operational concepts. It should also appeal to history buffs and to military analysts.

GUERRILLA: COLONEL VON LETTOW-VORBECK AND GERMANY'S EAST AFRICAN EMPIRE, by Edwin P. Hoyt (Macmillan, 1980. 246 Pages). Reviewed by Captain Harold E. Raugh, Jr., United States Army.

At the end of World War I, only one German force remained undefeated — that of Major General Paul von Lettow-Vorbeck in German East Africa. In this fast-paced book, Edwin Hoyt tells the enthralling story of how the Germans conducted the first successful guerilla campaign in history.

With no more than 3,000 German and 11,000 native soldiers, von Lettow-Vorbeck successfully diverted more than

300,000 much-needed British and Imperial troops, plus 130 generals, from the Western Front. His campaign also drained the British treasury of billions of pounds sterling, at no cost to the Kaiser's government.

How von Lettow-Vorbeck kept his force together in the jungle with no monetary or logistical support from Germany is a story of charismatic leadership, self-discipline, and an unparalleled devotion to duty. His actions provide a superb example of altruistic leadership that all Infantry leaders would do well to emulate.

Unfortunately there are no photographs, illustrations, or maps in the book, any of which would have improved its quality. An annotated bibliography does provide additional reference for the reader.

RECENT AND RECOMMENDED

THE UNKNOWN SERVICEMAN OF THE VIETNAM ERA, by The Center for Military History. USGPO, 1985. 38 Pages. S/N 008-029-00138-1. \$2.50.

DICTIONARY OF BASIC MILITARY TERMS — A SOVIET VIEW. Published under the auspices of the U.S. Air Force. Reprint of the 1982 Edition. USGPO, 1985. 200 Pages. S/N 008-070-00360-1. \$6.50, Softbound.

BOLDNESS BE MY FRIEND. By Richard Pape. St. Martin's Press, 1985. 422 Pages. \$11.95.

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From The Editor

1985 INDEX

We still have on hand a number of copies of our 1985 index. As we mentioned in our January-February 1986 issue, we prepare the index separately and make it available free of charge to anyone who requests a copy. Please address your request to Editor, INFANTRY Magazine, Box 2005, Fort Benning, GA 31905-0605, or call us at one of the telephone numbers listed on Page 1 of any recent issue of the magazine.

SWAP SHOP

In our January-February 1986 issue, we reinstated our Swap Shop department and published in that issue two Swap Shop items. We had another such item in our March-April 1986 issue.

This department is designed to allow infantrymen everywhere to share practical ideas they have used successfully in doing their jobs. These are short items and we use them as fillers whenever we have room for them—or occasionally we will make room for one.

So if you have an idea you want to share with your fellow infantrymen, send it in. Remember that this is your department, and it won't work without your help.

SCHEDULES

During the past several months we have received a number of requests for information about the various classes taught at the Infantry School—start dates, for example, and end dates for such courses as OCS, ANCOC, IOBC, and IOAC.

We will be happy to furnish, on request, schedule information on particular courses. Call or write us and we'll get the information to you as fast as we can.



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