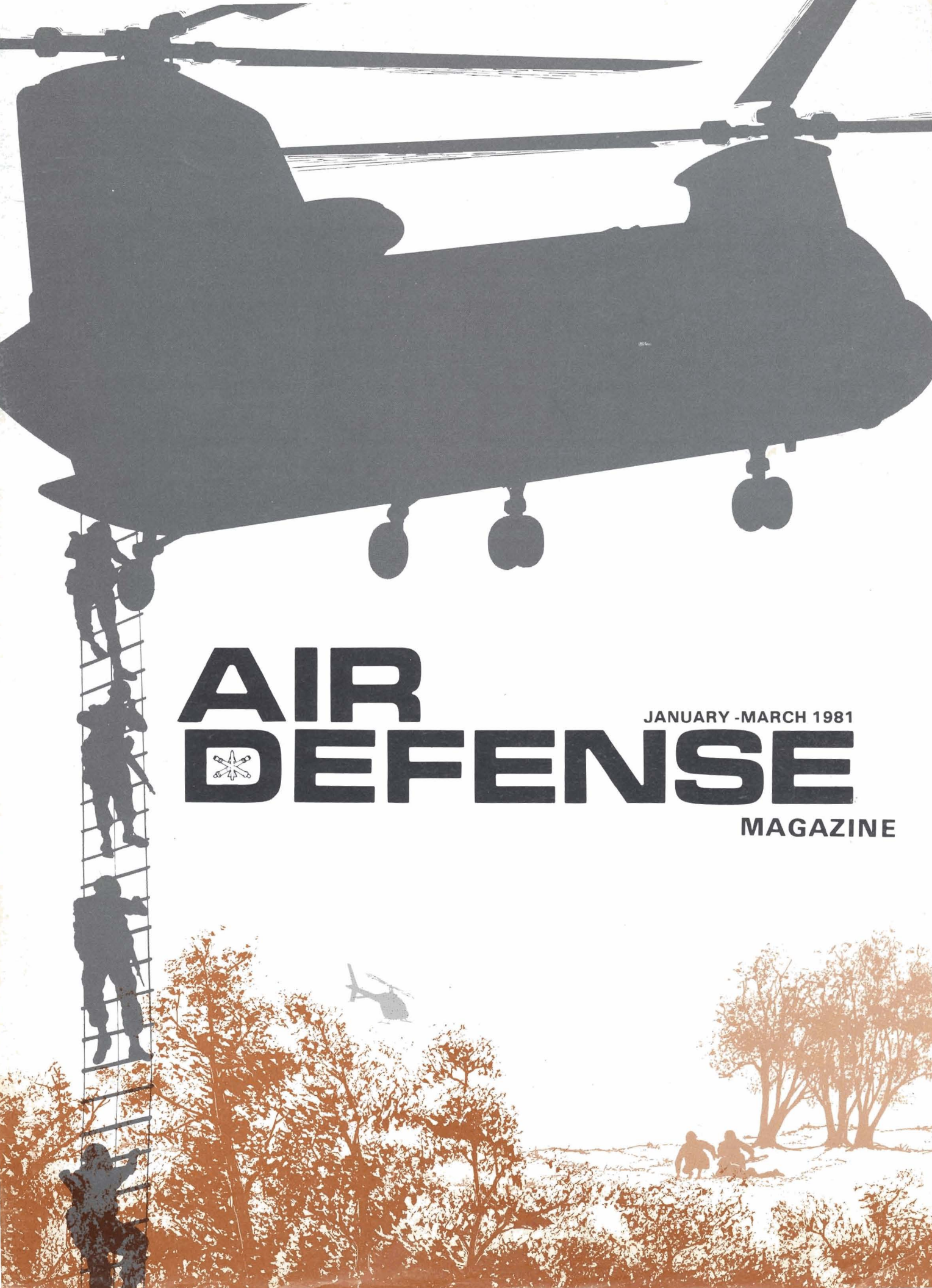

AIR DEFENSE MAGAZINE

JANUARY -MARCH 1981

AIR DEFENSE MAGAZINE

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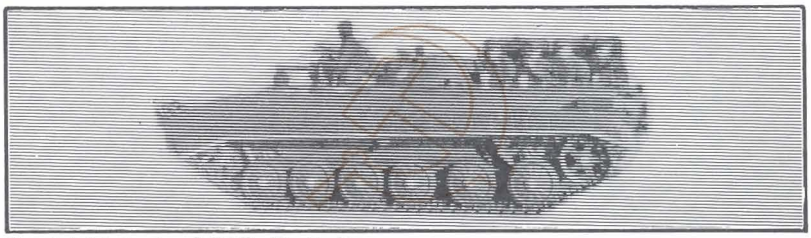

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AIR DEFENSE

"The Bridge over the Chasm of Defeat."

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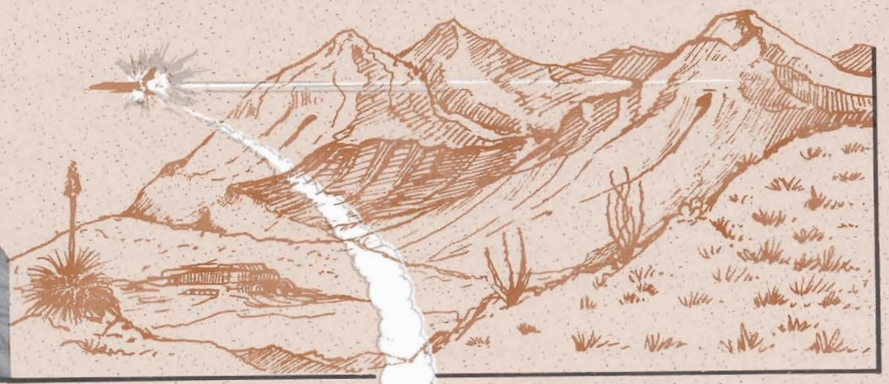


INTERCEPT POINT

Major General John B. Oblinger, Jr.

RETO — TRAINING FOR TOMORROW'S OFFICERS

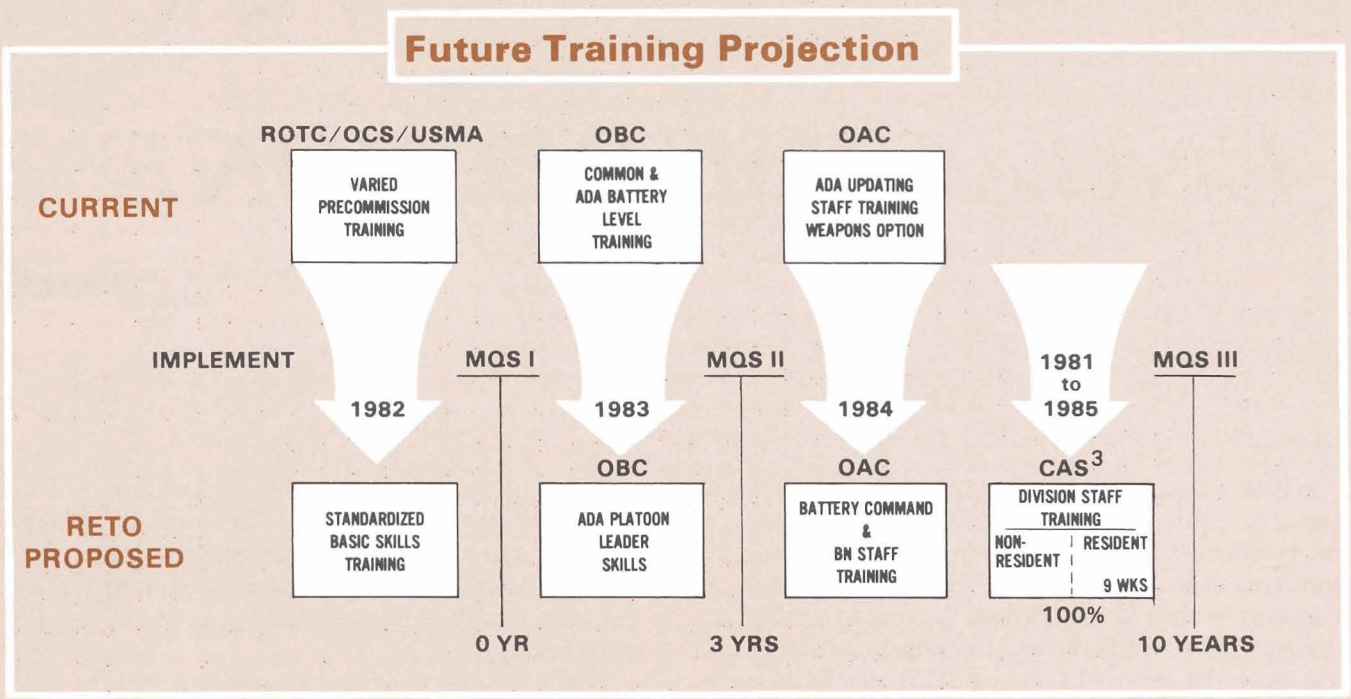
From World War II to the present, the system of military training and education of officers has existed with little or no change. Instructional material changed as new weapons and tactics were introduced, but the instructional methods and the basic system which supported that instruction have remained essentially the same. In general, training focused on group-paced and instructor-centered training, providing the officer student with a wide array of knowledge that has historically proven necessary for performance of any of a variety of jobs.

That educational system served us well during the past but time, circumstances, and requirements have changed. We are in an era of ever-accelerating technological change. Requirements for technical and professional competency have never been higher, yet time and resource constraints have seldom been more stringent. If we cannot train more and longer, it is imperative that we train harder and smarter.

Recognition of this critical need prompted the Chief of Staff of the Army, in 1977, to direct the conduct of a study known as the Review of Education and Training for Officers (RETO). The purpose of the review was to develop the most cost effective training and educational policies and programs which would combine self-development, unit development, and institutional development for the officer in a phased schedule from precommissioning or preappointment training to career completion. Its goal was to develop and implement a total officer training system which would meet the challenge of the 1980s and 1990s.

More than one-fourth of active duty commissioned and warrant officers in the Active Army were surveyed to identify job requirements, with data analyzed for indicators of the education and training needed for satisfactory performance. Results were used as a basis to recommend an education and training system to support the technical, functional, and professional needs of the officer corps.

The system proposed by the study seeks to fulfill that objective for officers by identifying and training toward set levels of competency based on time phases in an individual's career. These phases for company grade officers are: precommission, lieutenant, and captain. Mastering the requirements at one level is required for the officer to advance to a higher level. These levels of competency, or military qualification skills (MQS), will be achieved through a combination of successful completion of specific resident or exportable courses, professional readings, and task performance achievement. Reserve Officers' Training Corps, Officer Candidate School, and West Point will have the responsibility of preparing the students to pass the precommissioning phase (MQS I). Branch schools and local commanders will have joint responsibility for preparing lieutenants to achieve the next phase, MQS II (basic specialty competency), and for preparing captains to attain



MQS III (advanced specialty and staff competency).

To achieve these goals, the officer of the late 1980s and early 1990s will be commissioned out of a reconstructed precommissioning training program designed to meet MQS I standards. Following commissioning, he will attend an intensified, job-oriented, basic course and complete associated professional development training necessary to attain MQS II objectives. Later he will attend a restructured advanced course focusing on assimilating common staff skills, mastering specialty unique tasks, and developing command abilities. His MQS III training will then culminate in completion of a combination of exportable and resident training at Fort Leavenworth, Kansas, during his 7th through 9th years of armed forces commissioned service. This training will be conducted by the Combined Arms Services and Staff School, a new educational entity, which will focus on developing division-level staff competency. Upon promotion to field grade, the officer will be eligible for subsequent staff training to be taught at Fort Leavenworth by the Command and General Staff College, or at other service colleges, and attendance at various war colleges.

The United States Army Air Defense School (USAADS) is scheduled to begin implementing RETO-based instruction in 1983. The first step in developing this training, a thorough examination of company grade commissioned officer jobs to identify related competencies, is currently underway. This activity will differ from past efforts at USAADS in that an individual input from every air defense officer is programed. Worldwide surveys prepared by USAADS and administered by the US Army Soldier Support Center are scheduled to be sent to the field early in 1981. This new effort will better identify the skills, knowledge, and job competencies required by each officer to fulfill his responsibilities and support his professional needs.

I solicit your sincere support in this effort because your future training and that of your subordinates will be developed based on what you say in the survey. With your full cooperation, we can take a significant step forward in assuring that our officers are as combat ready as training can make them.

John B. Blesinger

ENGAGEMENT ZONE

letters to the editor

ON ACTIVE DUTY TRAINING

Dear Sir:

While on active duty for training (ADT) as a Reserve officer (during the period 8 to 19 September 1980), from my own experiences and in conversations with other Reserve officers, I discovered that there is room for improvement in the general attitude toward the Reserve officer and the use of Reserve officers on ADT. I want to say something about that.

I perceived that the officer on active duty views the Reserve officer as some sort of "strange animal." He may not look like an active duty officer as far as haircut and general appearance are concerned, but he is there to serve his country just the same. After completing an initial active obligation, he has chosen to remain on-call for rapid mobilization, which entails yearly 2-week ADT assignments. He has a civilian job that may or may not have any relation to his military job, ranging from student to factory worker to executive. He can and will perform almost any duty in the unit to which he is assigned, including smoothing out problem areas or foreseeing problem areas that could go unnoticed by his active counterpart.

Most of the Reserve officers with whom those on active duty will come in contact will be members of the Individual Ready Reserve (IRR). This organization is responsible for the control of all nonunit Reserve personnel in the Army. They control the ADT assignments for Reserve officers. The concept behind the IRR program is such that in peacetime all of the personnel in the program who request ADT receive it to the extent that funds permit. They are encouraged, however, to join a Reserve unit when possible.

The main purpose of ADT is to help keep the officer current in his MOS and to familiarize him with pertinent areas outside his MOS. Now, as in the past, the Reservists will be the bulk and brawn of the Army in the event of mass mobilization. Reserve officers will be taking over for active duty officers as they depart to fill commands and key duties in the early phases of combat. Reserve officers will also be the commanders of new units as they are formed. Forming new combat units in an emergency is the primary purpose of the IRR program.

When a Reserve officer comes to a unit for ADT, it is the responsibility of the active duty officer to whose organization he is assigned to find a meaningful job for that officer. This may include a special project that the unit needs accomplished or several small jobs that are necessary and within the officer's MOS. The Reserve officer on ADT is assigned to a unit for a very short time, and it is essential that he be placed in a position and put to work as soon as possible. The job should not be a meaningless one such as shuffling papers. The duty position to which the officer might be tentatively assigned has been discussed with the officer's branch in the IRR to enhance his career progression. In some cases, he may lack expertise, so familiarization with a weapon system to broaden the Reservist's knowledge may be necessary.

The Reservist is anxious to get started in his duties. He knows the ADT program helps him to keep current in his branch and to retain familiarity with weapon systems and doctrine that are vital to the Army in mass mobilization. He is willing to work the hours necessary to accomplish the tasks assigned him. His job function during ADT is not to fill gaps in the unit's manning structure but to assist his active duty counterpart in fulfilling his mission. It is true that he is there for a short time, but he wants to feel that he has added something to the unit and that the unit has gained something from him. To accomplish this, he must be given the opportunity.

The Reserve officer on ADT is there to learn and is willing to teach in return. Remember, he may be working for you in an emergency, and what you

can teach him now will not have to be taught later when there is little or no time.

ROBERT J. CHEENEY
1LT, ADA
USAR

NEWLY COMMISSIONED OFFICERS

Dear Sir:

I have felt for some time that some word ought to be spoken about the treatment of newly commissioned officers entering on active duty. I haven't seen anything published recently, and people do need reminding from time to time.

Robert Louis Stevenson once observed, "So long as we are loved by others, then I would say that we are indispensable. No man is useless while he has a friend."

Stevenson might well have added: "And pity the poor second lieutenant." Feeling friendless and useless much of the time, the newly commissioned officer wanders about in an alien world, eager to learn and contribute and frequently being rebuffed at attempts to do either. True, the battery commander and platoon sergeant are supposed to be "friends," but it isn't too long before most second lieutenants discover that friendship is contingent upon adopting methods and procedures approved by the CO and platoon sergeant. Disapproval more often than not is indicated in the form of warped facial expressions and tones of voice that dampen spirits and stifle enthusiasm.

Based on my own recent experience as a second lieutenant, I offer some observations and suggestions for those charged with the important task of introducing newly commissioned officers to military life.

Instruction on the practical functioning of things should be done *in private*. Sarcasm and a know-it-all attitude are counterproductive.

Advice and counsel given young officers must be balanced with opportunities to employ initiative and make decisions. The commander creates these situations by providing a mission statement (not a step-by-step detail of how to accomplish the task) and then by monitoring (not directly influencing) progress.

It is crucial that the second lieutenant never be circumvented in the chain of command. No other single act can do more to make a young officer feel unimportant and useless to the organization.

Commanders must make sure that newly assigned, young officers are thoroughly familiar with battery policies and procedures. Errors arising from lack of knowledge are particularly embarrassing at a time when credibility and a feeling of self-esteem are on the line.

The platoon sergeant can assist the second lieutenant's growth and development by showing proper respect and a genuine interest in the lieutenant's opinions. This, of course, is a two-way street if the relationship is to be effective. In many respects, the platoon sergeant, with his store of knowledge and experience, holds the key that can make or break a new lieutenant. If he allows the new lieutenant to make judgement errors without first offering alternatives, then he has simply failed in an important aspect of his job.

Now some tips for second lieutenants beginning military life:

Do not adopt a superhuman attitude toward enlisted men. Effective leaders are in touch with their troops. On the other hand, you cannot be "one of the boys." Your job involves giving orders and as a result you must maintain distance between you and those in your charge. Young lieutenants should recall Major William Worth's admonition: "An officer on duty knows no one." He knows only his duty.

Never correct a noncommissioned officer in front of his subordinates. If an NCO makes an error he should be counseled in private. He'll appreciate this demonstration of good leadership technique and probably try to avoid repeating the error.

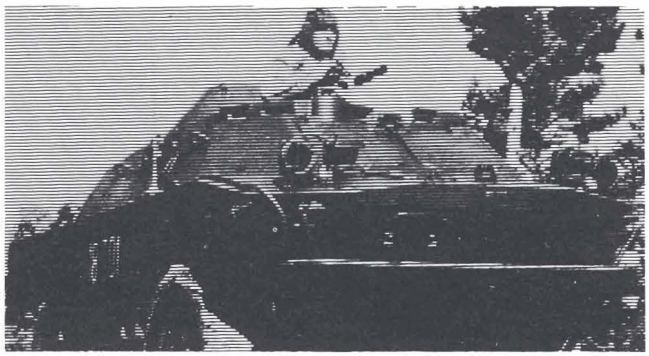
Carry out the commander's orders as if they were your own. Even if you disagree with an order, it's your duty — unless the order is unlawful — to carry it out. Unpopular as an order may be, never indicate that you side with anyone but the commander.

Become as familiar as possible with your subordinates' problems, both mental and physical. And take care of your troops. Let them know you're with them. If, for example, it is necessary that a task be carried out in the rain, the platoon leader should be there with his troops. His presence will inspire performance; his absence will weaken it.

Finally, it is incumbent upon the second lieutenant to learn as much as possible — as quickly as possible — about the troops' work and the equipment they will use. With this knowledge there is less chance of embarrassment before the veterans — both commissioned and noncommissioned — who from time immemorial have taken delight in making sport of the fledgling officer entering active service.

MELVIN F. BENNETT III
1LT, ADA
HHB, 1st Bn, 4th ADA

SOVIET MOTORIZED RIFLE BATTALION (REINFORCED) IN THE DEFENSE



by Dale D. Best (Analyst)

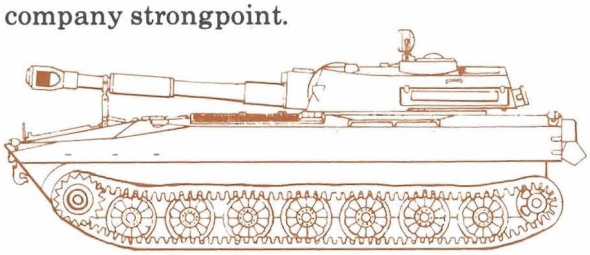
This is a scenario describing the actions of a typical, reinforced, Soviet motorized rifle battalion (MRB) deployed to defend against an attacking force. A delay in the attack by US forces has given Soviet units 24 hours to prepare a defense. US forces have stopped forward movement of a Soviet motorized rifle division. The Soviet division commander has directed that first echelon regiments prepare a hasty defense and, time permitting, develop a deliberate defense.

The map shows a first echelon reinforced MRB defense in the primary sector of the forward security zone. No attrition factors have been applied to weapons or vehicles.

The defense is based on the regimental commander's concept of the battle, terrain factors, maximum use of antitank weapons, and maneuver space for withdrawal. In this situation, the regimental commander directs the battalion commander to position one reinforced motorized rifle company (MRC) well forward. Two MRCs are positioned behind the forward MRC and a two-platoon-size battalion reserve is located approximately 1 kilometer to the rear of the center of a firepocket. If the first echelon MRC is forced to move to alternate positions to the rear, the fires of the battalion can be brought to bear on the US force entering the firepocket. Land mines (antitank and antipersonnel) are placed along the forward edge of the initial line of resistance and in front of each company strongpoint.

A 122-mm SP howitzer battalion from the regimental artillery group (RAG) has been placed under operational control of the MRB commander. For supporting fires, preplanned barrages have been coordinated with the MRB commander. These barrages will be laid along the initial line of resistance in front of the minefields and company strongpoints. They are depicted on the map by a straight line with a letter affixed at the left end. Artillery concentrations, designated as zones of fire, are also preplanned. These generally

Below: 122-mm SP howitzer.



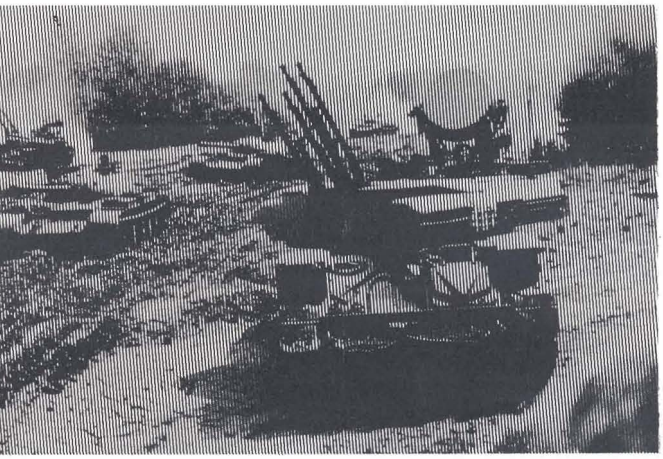
SOVIET MOTORIZED RIFLE BATTALION (REINFORCED) IN DEFENSE

straddle the main route of advance into the overall defensive position. They are indicated on the map by a box with the letters "ZF" inside and a number at the lower left corner. The artillery commander is collocated with the MRB commander. The commander of the organic 120-mm mortar battery, positioned in the vicinity of the battalion reserve, also maintains close contact with the MRB commander. In addition, the fires of his unit are coordinated with those of the artillery battalion. Should the MRB be unable to contain US forces in the firepocket, detailed plans have been developed for orderly withdrawal of the artillery, one battery at a time, while continued fire support would be provided by another artillery battalion positioned farther to the rear.

An antitank guided missile (ATGM) battery from the parent regiment is attached to provide additional firepower. One platoon, consisting of three BRDM scout cars mounted with an AT-3 SAGGER or AT-5 SPANDREL, is attached to each of two MRCs and one to the reserve. A medium tank platoon of four tanks from the tank battalion of the motorized rifle regiment (MRR) is attached in support of the forward MRC. The rest of the tank battalion remains under control of the regimental commander. Two antitank minelayers and an engineer unit (position preparation section) are attached from the regimental engineer company. Air defense is provided by a section of two ZSU-23-4s attached from the parent regiment to augment battalion organic SA-7s. The battalion is also protected by the air defense umbrella of regimental SA-9s, divisional SA-8s/SA-6s, and Army SA-4s.

Minefields are placed approximately 100 meters in depth and from 400 to 600 meters in length. In this situation, each field consists of three rows of mines. The first row contains antitank mines placed 5.5 meters apart; 30 meters to the rear is a second row of antipersonnel mines placed at a density of two mines to each meter. Thirty meters to the rear of the second row is another row of antitank mines. Soviets never mix their antipersonnel and antitank mines in the same row. Antipersonnel mines are laid manually because the Soviets do not have a machine-laying capability.

Below: ZSU-23-4
Right: Motorized Rifle Troops

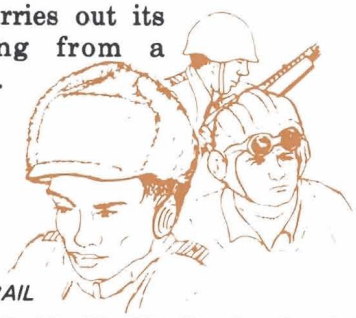


To the rear of the initial line of resistance is the reinforced MRC, prepared to resist the initial thrust of US forces. The mission of this MRC is to inflict maximum destruction and disruption of US forces and to preserve forward defensive sectors as long as possible. The company commander organizes his fields of fire to fully exploit the firepower of the attached tanks and BRDM-mounted ATGM. Communications trenches are dug and a limited amount of breastworks is built to protect vehicles because time does not permit full defilade protection. Some alternate vehicle positions are also prepared. If the forward MRC is forced to withdraw, it follows preplanned routes to alternate defensive positions. These alternate positions are more than a kilometer to the rear. They were previously prepared in the vicinity of the battalion reserve.

The MRC on the left flank, reinforced with an attached ATGM platoon, is positioned on high ground providing good observation and fields of fire into the firepocket. Withdrawal is implemented only upon order of the battalion commander.

The MRC on the right flank, also reinforced with an ATGM platoon, has one BMP platoon detached as the battalion reserve. This MRC is positioned also on high ground with good fields of fire and protection. Its mission closely parallels that of the MRC on the left flank.

The battalion reserve, consisting of a BMP platoon and an ATGM platoon, is positioned on high ground astride the main ingress route. Its primary mission is to defend a prepared strongpoint in the depth of the overall defense position. The reserve usually carries out its mission by firing from a stationary position.



Below: SA-7 GRAIL

DALE BEST *is an analyst on Soviet operational strategic doctrine and organization and is Chief of General Intelligence Branch, TRADOC Threat Directorate. He holds a Master of Science Degree in International Relations, with emphasis on Soviet Affairs, from Georgetown University.*

HAWK IN SUPPORT OF THE DIVISION

BRAVE SHIELD '80

by First Lieutenant Robert S. Barnes

Operation Brave Shield '80, conducted at Fort Polk, Louisiana, was the backdrop for a Hawk battery, accompanied by battalion command and control elements (battalion operation center; AN/TSQ-73, command control van) in support of the 101st Airborne Division (Air Assault). The Hawk contingent was part of the 1st Battalion, 65th Air Defense Artillery, from the 11th Air Defense Artillery Brigade stationed at Fort Bliss, Texas. According to doctrine, a division-size unit is supported by a Hawk battalion. However, the division employed only one maneuver brigade, therefore, the use of one Hawk battery was sufficient to provide low-to-medium altitude air defense for the division area. Integration of the air defense systems on the battlefield is an essential part of any effective surface-to-air deterrent. The division organic air defense of short-range air defense systems does not provide defense against medium-altitude enemy aircraft. The Hawk fire unit fills this gap of air defense coverage for the division airspace. Additionally, when called upon the Hawk battalion can supplement the forward area alerting radar (FAAR) for early warning of hostile aircraft. This is accomplished with the ICWAR which has considerably greater range than the FAAR. The battalion operation center (BOC) can also supplement the division tactical flight coordination center (FCC) in terms of division airspace management. Obviously, numerous advantages are afforded the division by the addition of a Hawk unit providing air defense.

During Brave Shield '80, several command control functions were exercised and tested. An IHawk liaison officer (ILNO) was collocated with the division air management element (DAME). A liaison officer (LNO) from the Chaparral/Vulcan (C/V) battalion was collocated with the BOC of the IHawk battalion. The ILNO established communications with the IHawk battalion S3 via multichannel communications with a backup frequency modulation (FM) system. The FM system was exercised and proved effective.

According to doctrine, air defense priorities are set by the division commander.[1] The C/V battalion commander is a member of the special staff which advises the division commander on operations of a particular nature.[2] For this reason, the C/V battalion commander, in conjunction with the division G3, assists the division commander in determining the air defense priorities. The main controlling element of the Hawk unit is the tactical air control center (TACC). Control information in the form of a surface-to-air weapons engagement order (SWEO) is disseminated to the BOC via a control and reporting center.[3] Air defense rules and procedures, for this reason, are available to the division via the BOC.

HAWK Interface

The division commander tasked the Hawk fire unit with defense of the division support command area of operation and the division main command post. Due to the insertion of the Hawk contingent in the division air defense force structure, the brigade ground operations were unhindered by enemy airpower throughout the entire exercise. Even though the division rear area was the priority set for the Hawk fire unit, numerous aircraft meeting hostile criteria fell into the Hawk missile kill zone.

Thus, a substantial number of opposition forces aircraft was assessed as killed. The BOC supplemented

the FAAR throughout the exercise with early warning information converted to the division organic matrix system. This is done by overlapping transparent overlays of GEOREF and UTM coordinates with the organic division matrix system. In addition, the FAAR warned the BOC of hostile aircraft which were invisible to the Hawk radars due to terrain obstructions. At the DAME, the information from the FAAR was converted from the matrix to geographical reference (GEOREF) system coordinates. The possibility of collocating an element of the FCC was addressed, as well as the possibility of replacing the FCC with organic equipment available at the Hawk site. Supplementation of the FCC with the Hawk radars would add an additional dimension of flight control in the form of live radar video in conjunction with the existing flight following communications. The FCC in turn could assist the BOC in positive identification of friendly aircraft. Replacement of the FCC was determined to be infeasible due to a limitation of communications assets in the Hawk battalion. The flight following communications necessary for complete operation of the FCC at the Hawk BOC consists of an ARC-115 and an ARC-164. These two items of equipment, if obtained, would require modification to be remoted into the AN/TSQ-73 command control van. This proposal merits further study during future exercises.

Essential Coordination

It is essential during the conduct of the air battle within the division area that internal division air operations be disseminated to all air defense systems operating in the division. Thus, by imposing a weapons hold for a certain sector and time, he would insure that friendly air operations would not be under jeopardy of engagement from divisional air defense systems. It is the responsibility of the division G-3 to keep the air defense elements informed of all major air insertions.[4] It is the responsibility of the division G-4 to keep the air defense elements informed on service support airlifts.[5] During the exercise, a deep insertion of airborne personnel in the early morning hours of 18 August was conducted without prior coordination with the air defense elements. Thus, the entire operation was threatened by the Hawk fire unit in that the insertion traversed the missile kill zone. Additionally, a low-altitude drop of supplies was conducted without prior coordination. These operations are presented to emphasize the importance of a constant flow of information within the division main command post. In so doing, a discriminating air defense force structure is attained, thus eliminating engagements of friendly aircraft.

To properly assess the battle damage credited to the Hawk fire unit, live radar video must be available to the controller at all times. The controller then has the capability to correlate engagement reports from the Hawk fire unit with the flight plan of the opposition force aircraft. In so doing, proper battle damage assessment can be awarded to aircraft which are not destroyed, and battle damage neutralized for those aircraft that are destroyed. In addition, aircraft can be grounded to depict an accurate airpower structure realistically. Without these controls, the Hawk fire unit has practically no bearing on the air battle. Controller procedures such as described above should be insisted upon to provide a more accurate estimate of the Hawk fire unit's capabilities in countering the enemy air threat.

Operation Brave Shield '80 proved that Hawk in support of the division is not only a multipurpose asset but is essential to present a viable air defense force structure. The air threat on the battlefield is as potentially devastating as the Blitzkrieg of World War II. Failure by the commander to properly use the air defense systems under his control can result in disaster. Successful employment of division organic air defense systems in conjunction with a Hawk fire unit as demonstrated in Brave Shield '80 allows the division to maneuver, with less danger from enemy aircraft, to accomplish the mission. Of course, this freedom to maneuver is contingent upon the ground force remaining under the air defense umbrella. Innovation has proved to be the key to successful military operations throughout history. Flexibility to match the ever-increasing air threat will be the key to successful military operations in the future. A medium-altitude air defense system in support will provide this needed flexibility for the combat division.

Footnotes:

[1] "Infantry, Airborne, and Air Assault Division Operations; FM 71-101" (Washington, DC: Department of the Army, 1980), p. 3-1.

[2] Ibid; p. 3-2.

[3] "US Army Air Defense Artillery Employment; FM 44-1" (Washington, DC: Department of the Army, 1976), p. 3-4.

[4] "Infantry, Airborne, and Air Assault Division Operations; FM 71-101" (Washington, DC: Department of the Army, 1980), p. 3-24.

[5] Ibid, p. 3-24.

Editor's Note: Hawk in direct support of the division is a possible tactical mission; however, it is more probable that Hawk units will be assigned a General Support (GS) or Reinforcing (R) mission.

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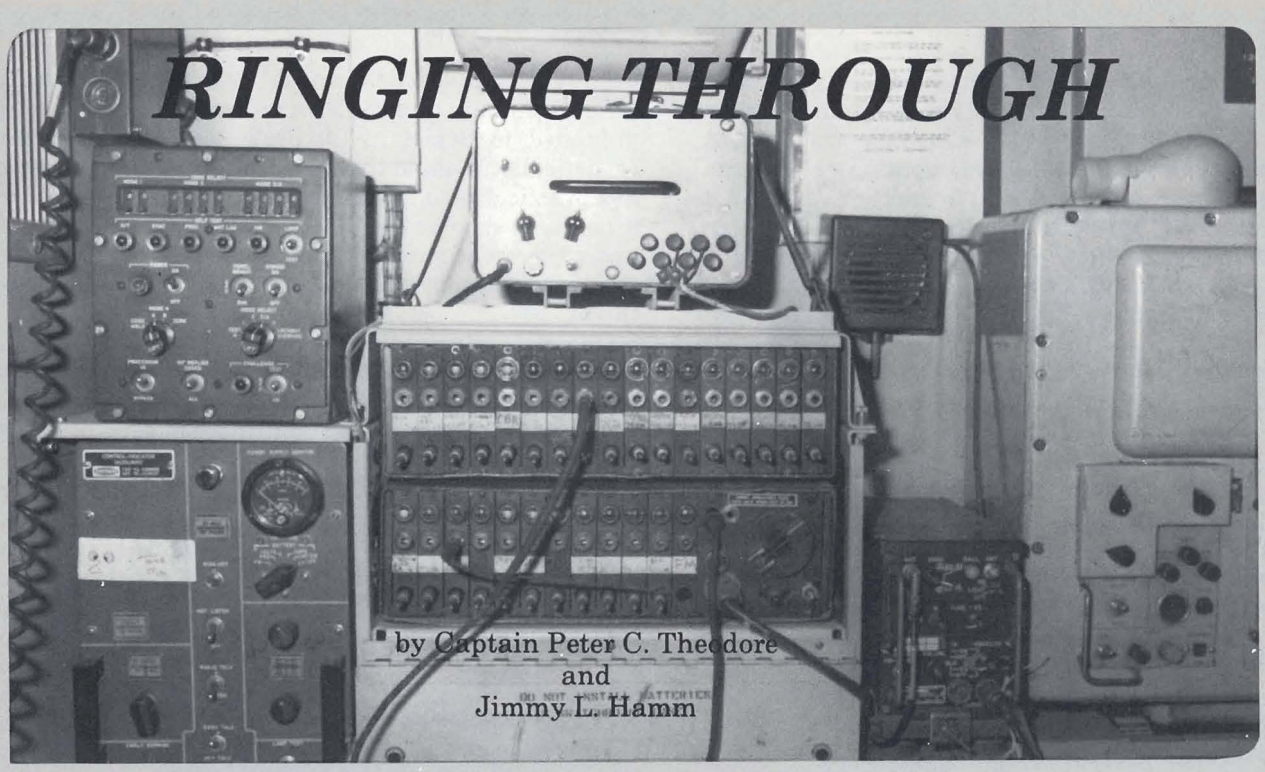

RINGING THROUGH

by Captain Peter C. Theodore
and
Jimmy L. Hamm

How one Improved Hawk battalion solved a long-standing communications interface problem between the battalion operations center and the Hawk firing battery by reallocation and use of organic equipment.

The publishing of this article should not be construed as approval by the US Army Air Defense School or Department of the Army of modifications involved.

In 1972 32d AADCOM began its conversion from Basic to Improved Hawk. At that time, the AN/MRC-69 multichannel terminal was in use throughout the command for IHawk intrabattalion communications. The AN/TRC-145 multichannel terminal began to replace the AN/MRC-69 in early 1975. However, after the initial fielding of the AN/TRC-145, a serious interface problem developed.

The problem surfaced when battalion AN/TSQ-38 fire distribution system operators attempted to "ring down" subordinate fire units over four-wire circuits. Technically, this should have generated an audible alarm at the improved battery control central (IBCC) communications control unit (CCU) or at the improved platoon command post (IPCP) tactical officer/radar operator (TO/RO) communications panel. Additionally, the HOT CALL and intelligence radar reporting (IRR) lamps on the CCU or TO/RO communications panel should have lit. Unfortunately, neither of these indications appeared. The only indication of a call available to the tactical control officer (TCO) or TO under these circumstances was a faint, audible tone in his headset. If the TCO/TO did not happen to be wearing his headset at the time of the call, it was impossible for him to hear this faint alarm.

The problem was reported through logistic channels to the US Army Missile Command (MICOM) Systems Engineering Office for evaluation. MICOM determined that the original "ring-down" capability was lost when the AN/MRC-69 was replaced by the AN/TRC-145. Originally, a 1600-Hz ring signal had been generated by the AN/TSQ-38, then transmitted and converted by the AN/MRC-69 to the 20-Hz ring signal required by the IBCC/IPCP for signal activation. However, the AN/TRC-145 had not been designed for this 1600-Hz to 20-Hz signal conversion.

To correct this problem, MICOM generated an engineering change proposal (ECP) in 1976 to add a printed circuit card in the information coordination central (ICC) and IPCP auxiliary control unit. This circuit card was designed to detect the incoming AN/TSQ-38 1600-Hz signal and, in turn, generate the required IBCC/IPCP 20-Hz ring signal. Ultimately, however, this ECP was rejected as cost prohibitive (approximately

$750,000 for worldwide application). As an alternative, a roundabout procedure was conceived. On the internal HOT LOOP, the AN/TSQ-38 operator would call the BOC SB-611 patch panel operator who would then call the BOC AN/TRC-145 operator via intercom. Next, the BOC AN/TRC-145 operator would contact the fire unit AN/TRC-145 operator on the autowire handset. Finally, the fire unit AN/TRC-145 operator was required to leave his communications shelter, walk to the IBCC/IPCP, and tell the TCO/TO to meet the BOC operator on the four-wire voice circuit.

Operations-oriented soldiers found this solution totally inadequate. Precious minutes could be lost while the BOC was attempting to reach the fire unit. Hopefully, this problem would be corrected with the fielding of the AN/TSQ-73 Missile Minder system, scheduled for Germany in 1978. But the problem remained. The 3d Battalion, 60th Air Defense Artillery (Hawk), experienced serious interface problems during its 1979 Allied Air Forces Central Europe (AAFCE) tactical evaluation — after fielding of the AN/TSQ-73. Shortly thereafter, an earnest search was begun for a viable solution (fig 1).

In-country Communications and Electronic Materiel Readiness Command (CERCOM) representatives were first contacted for additional details concerning the functioning of AN/MRC-69 ring-down circuitry. It was learned that the AN/MRC-69 accomplished the 1600-Hz to 20-Hz signal conversion through TA-182 ring converter equipment. These converters were still available in Germany, but they posed an installation problem in that they required 60-Hz operating power (the IHawk system operates on 400-Hz power). The concept of mounting TA-182 converters in the AN/TRC-145 was next considered but eventually discarded due to the electrical complexity of AN/TRC-145 communications equipment. The entire TA-182 converter concept was finally abandoned when it was discovered that the converters were scheduled for replacement by a newer, solid-state ring converter, the CV-425/U.

At last, the search for a solution to the interface problem had begun to gain momentum. It was found that the AN/TGC-30 teletypewriter system, TOE equipment in IHawk battalions, contained six CV-425/Us as component items. Further investigation revealed that the AN/TGC-30 was capable of operation without these ring converters.

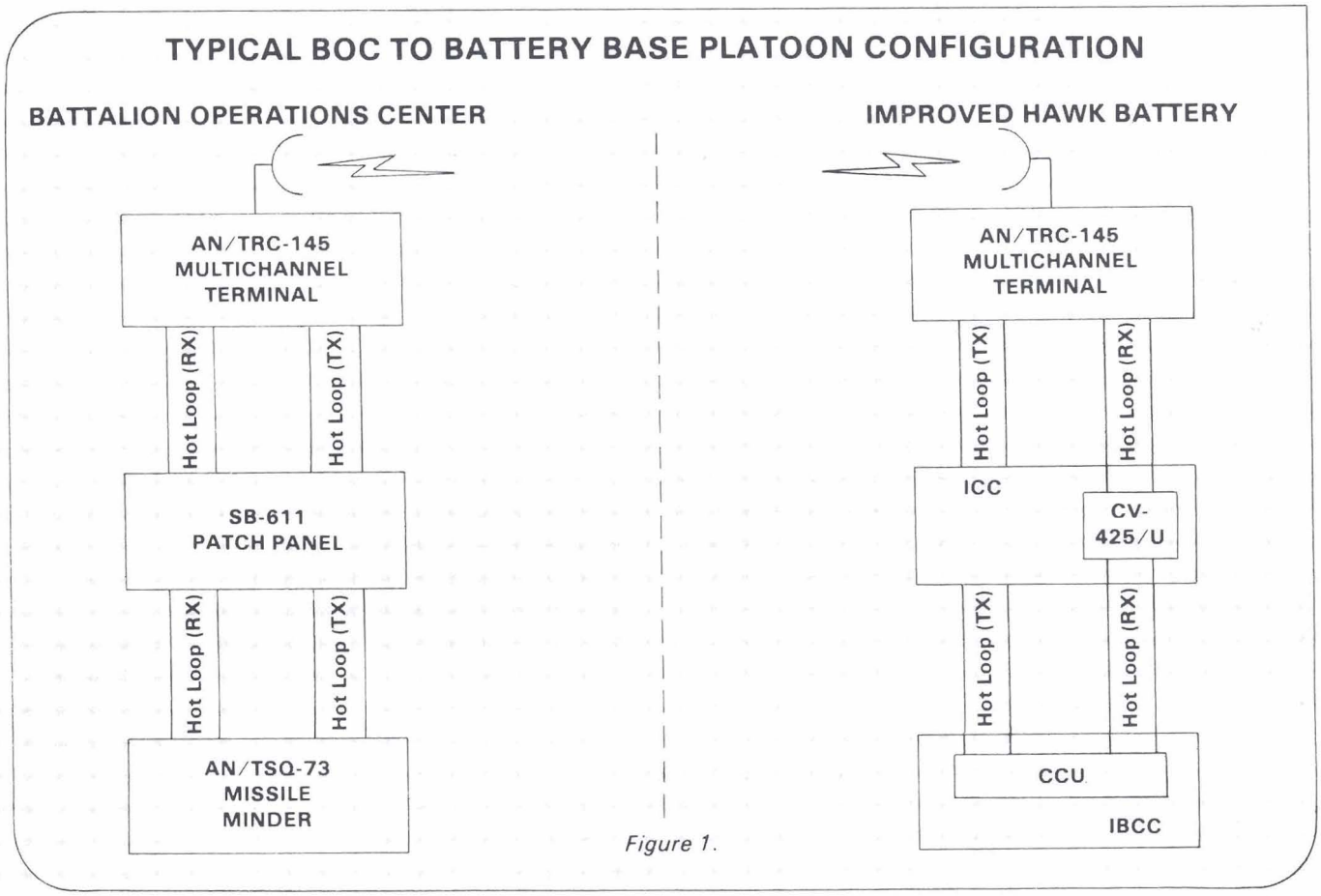

Figure 1.

One step closer to solution, it was found that not only could the CV-425/U be mounted in the ICC/IPCP, but the CV-425/U (operating on 115/230 VAC and 50-Hz to 440-Hz power) was compatible with IHawk power availability. Finally came the big question: would the CV-425/U properly interface and function with IHawk circuitry?

Using a CV-425/U and an IBCC CCU in unit under test (UUT) configuration, together with a direct support platoon (DSP) high-frequency console (HFC), a preliminary test was conducted. A 1600-Hz HFC signal was used to activate the CV-425/U, which provided an output of 20-Hz to the CCU. Results? The HOT CALL and IRR lamps lighted and the audible alarm sounded. The preliminary test was a success. Further in-depth tests were conductd by measuring signal levels within the CCU to determine whether circuits were being overloaded or any other problems existed. No adverse conditions were detected.

had to be designed — one for Product Improvement Program (PIP) IHawk and the other for non-PIP IHawk. It was found that the most convenient places to mount the CV-425/Us in the ICC and IPCP were on the top of the SB-22 switchboard retainer in non-PIP equipment and on top of the receiver-tranmitter RT-773 in PIP equipment.

Next came the electrical installation problem. After investigating several options, it was decided that the most effective and least complicated method was to use spare terminals on terminal board (TB) 15 located in the distribution box on the road-side wall near the front of the ICC and IPCP shelters. This was convenient because the HOT LOOP/IRR receive lines also connect to terminals on TB 15. Next, a wiring harness approximately 10 feet in length (12 feet for PIP equipment) was fabricated. The wiring harness consisted of four conductors to electrically connect the CV-425/U in series with the HOT LOOP receive lines. Two wiring harnesses are required if both HOT LOOP and IRR ring-down capabilities are desired (fig 2).

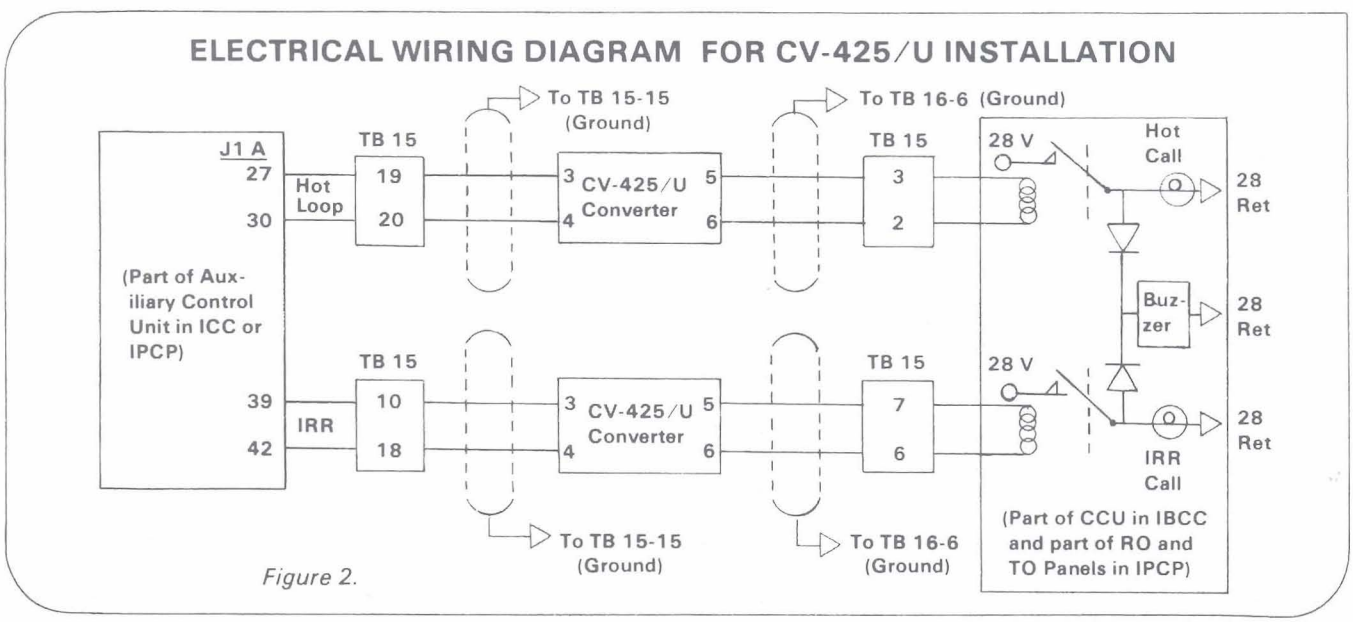

Figure 2.

Next came the task of conducting an actual test at an operational IHawk site. Battery C, 3d Bn, 60th ADA, was selected for the test. A CV-425/U was temporarily connected in series with the HOT LOOP and IRR lines in an ICC/IPCP. The AN/TSQ-73 operator then rang-down the battery on the HOT LOOP and IRR four-wire circuits. In each case, the HOT CALL/IRR lamps lighted and the audible alarm sounded. Following the successful DSP bench tests and the actual test at an IHawk battery came the task of deciding how to mount and electrically install the CV-425/U within the Hawk equipment. Two arrangements

The existing HOT LOOP receive lines were then removed from TB 15 terminals 2 and 3 and reconnected to one side of TB 15 spare terminals 19 and 20. (For IRR, remove terminals 6 and 7 from TB 15 and reconnect to TB 15 spare terminals 10 and 18.) Next, one pair of fabricated wiring harness conductors was connected to the other side of TB 15 terminals 19 and 20 and the other pair (same wiring harness end) to TB 15 terminals 2 and 3. The shield ground leads were connected to TB 15 (terminal 15) and TB 16 (terminal 6), respectively. (For IRR, connect one pair to TB 15 terminals 10 and 18 and the other pair to TB 15

terminals 6 and 7. The shield ground leads should be connected to the same terminals as in HOT LOOP installation above.) The wiring harness was routed through the cable channeling along the top of the shelter and behind the SB-22 switchboards.

With the wiring harness installed in the ICC and/or IPCP shelter, the next step was to connect the other wiring harness end to the CV-425/U converter. The wiring table below shows the proper connections for HOT LOOP installation:

FROM	TO (CV-425/U)
TB 15, Terminal 2	Binding Post 6 Loop 2W/4WR
TB 15, Terminal 3	Binding Post 5
TB 15, Terminal 19	Binding Post 3 Line 4W-R
TB 15, Terminal 20	Binding Post 4

If IRR capability is also desired, this wiring table shows the proper connections:

FROM	TO (CV-425/U)
TB 15, Terminal 6	Binding Post 6 Loop 2W/4WR
TB 15, Terminal 7	Binding Post 5
TB 15, Terminal 10	Binding Post 3 Line 4W-R
TB 15, Terminal 18	Binding Post 4

With the wiring harness installed and the CV-425/U converter connected in series with the HOT LOOP and/or IRR receive lines, the next step was to position the CV-425/U controls and switches for normal operation. The next table shows proper control positions:

POWER SWITCH	ON
TP/TG SWITCH	TP
2W/4W SWITCH	4W
SENSITIVITY SWITCH	HIGH (For weak received signals)
	LOW (For strong received signals)

One desirable feature of the CV-425/U installation is that if an operator fails to turn it on, or inadvertently turns it off, or if an internal circuit card failure occurs, only the ring capability is lost. Voice transmissions will continue to be passed by the CV-425/U to the IBCC/IPCP.

The estimated cost data for installing CV-425/U converters in the HOT LOOP receive circuits of a TRIAD and a Square IHawk battery are outlined below:

TRIAD Battery (Three Firing Platoons)

3 ea CV-425/U @ $393 ea	$1,179.00
3 ea fabricated wiring harnesses @ $5.74 ea (materials only)	17.22
3 ea strap assemblies @ $8.51 ea	25.53
Total Cost	$1,221.75

Square Battery (Two Firing Platoons)

2 ea CV-425/U @ $393 ea	$ 786.00
2 ea fabricated wiring harnesses @ $5.74 ea (materials only)	11.48
2 ea strap assemblies @ $8.51 ea	17.02
Total Cost	$ 814.50

Installation and use of the six CV-425/U converters in the HOT LOOP receive lines of the base and assault fire platoons (AFPs) within this battalion have greatly enhanced tactical operations and communications. CV-425/Us have been installed in three ICC and three IPCP shelters and, to date, have functioned flawlessly. The AN/TSQ-73 Missile Minder operators can now ring-down and immediately communicate with the TCO/TCA in the IBCC and/or TO/RO in the IPCP. This is absolutely essential during training, air defense exercises, tactical evaluation, and combat operations.

Looking to the future, Raytheon Company has ordered parts for three prototype models to validate the company's proposed solution to the ring-through problem. An engineering change is expected by the end of March 1981. If approved, modifications can begin but will be delayed until late FY 82 because of financial constraints.

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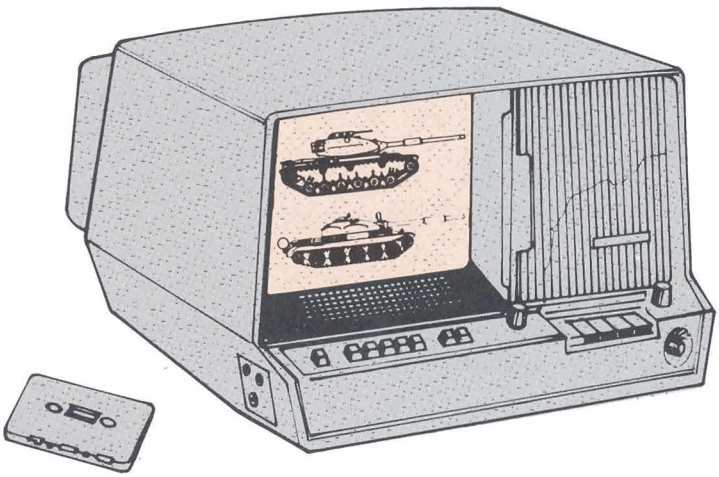
US ARMY TRAINING EXTENSION COURSE



(After 5 years in operation)

by Major Charles F. Hanselmann
and Jerry Perlman

In 1971 the US Army Board for Dynamic Training, later redesignated as the US Army Combat Arms Training Board (CATB), identified a critical need for a type of instruction that gears itself to the needs of the individual soldier after he has finished his initial formal military training. After several years of research and development by the US Army to initiate more effective and useful ways to train individuals, the Training Extension Course (TEC) Program was introduced.

TEC lessons were originally designed to assist in upgrading and maintaining MOS skill proficiency for combat arms soldiers. TEC lessons are prepared by service schools to train individuals in the Active Army, Reserve Components, and Army-related activities such as ROTC. TEC is an alternative to traditional group instruction where the soldier is required to participate regardless of qualifications and knowledge. The philosophy of performance-oriented training, training objectives, using standard go no go testing, and validated lesson development is part of the overall TEC system. TEC is a vehicle for communicating critical "how to" principles, techniques, and methods of MOS/job performance training while providing validated materials to train both individual soldiers and units.

TEC is closely integrated with and supports the enlisted personnel management system (EPMS), the soldier's manuals, skill qualification tests (SQT), and the Army training and evaluation program (ARTEP).

During the lesson development process, each TEC lesson is tested (validated) using soldiers from the lesson's target audience (i.e., soldiers skilled in the actual MOS are used during validation to test the effectiveness of the lesson). If members of the test group fail the pretest, then take the lesson and fail the posttest, the lesson is redesigned and retested until a representative sample of the target group can achieve the objectives of the lesson as indicated by passing the posttest.

The first step for a soldier in taking a TEC lesson is reading the lesson administrative instructions (LAI). The LAI outlines objectives of the lesson and skills required to take the lesson, and provides the pretest. The student instruction sheet (SIS) included with the lesson states objectives, materials needed, and time required. TEC lessons are standardized. A TEC pretest is designed to reveal a soldier's proficiency or lack of proficiency in his MOS. TEC tests are conducted under real world situations to give the NCO or officer a tool to measure the degree of soldier proficiency or unit proficiency and to prescribe appropriate training where applicable. If a soldier can pass the pretest, he can proceed to more advanced training without taking that particular lesson.

TEC lessons are prepackaged and soldier-tested for the critical tasks connected with MOS. TEC employs the latest developments in educational technology: empirical design (based on experience or observation instead of theory), "hands-on" performance, lesson validation trials, and various methods of media delivery or lesson format (e.g., printed, audiovisual, and audio tape).

Most TEC lessons are presented in audiovisual format using the Beseler Cue/See projector. This projector uses an 8-mm film packaged in an endless film loop cartridge with an accompanying standard audio tape in a separate cassette. The film and sound are programed to stop automatically to permit the student to answer questions or perform a task; then the student can reactivate the lesson by pressing a "proceed" button. All TEC equipment can be powered by a standard field generator and transported in protective carrying cases. The Beseler Cue/See can be used by one soldier at a time (with or without earphones) or a group of 2-15 soldiers. TEC hardware works well with 10-kw or higher ac generator power. Eight Beseler Cue/See machines are normally issued to each battalion-size unit with lesser amounts to separate companies or detachments. It costs about $7,800 to develop a TEC lesson and each copy costs approximately $3.00.

Lessons that are more appropriate for use in a field or motor pool situation (e.g., hands-on training) are developed in audio tape format. A soldier can listen to the tape on a standard portable cassette player as it "talks him through" the lesson.

A third form of TEC lesson material is the programed text. This is usually a soft-cover booklet with administrative instructions outlining the objective, materials needed, time required, references, and other pertinent information. Often the text is illustrated. Each printed lesson contains instructions, questions, and answers in step-by-step format.

All TEC lessons are self-paced. The soldier is able to learn at his own pace with any form of media. TEC lessons are designed to be given under field conditions. The lesson can be taken almost anywhere in the field as time permits. TEC lessons may be used during duty hours, nonduty hours, or a combination of both. TEC lessons are ideal for make-up or equivalent training or split drills. The lessons can be reviewed while waiting at the rifle range, in a truck or tent, or in connection with on-the-job training (OJT).

TEC helps soldiers prepare for their SQTs. Critical tasks required for the individual's MOS proficiency are in the soldier's manual. TEC

lessons mentioned in the manual will help the soldier achieve the desired level of proficiency. Each TEC lesson is designed to train a soldier to perform critical job tasks. TEC is used in both basic and advanced individual training and in unit training. TEC has, in many instances, replaced the huge classroom full of sleepy soldiers with an interesting, interactive, challenging alternative.

Instructors can give a high level of training without being an expert in every subject. A squad leader with minimum advance preparation can use a TEC lesson as a training aid by stopping the lesson to ask questions or discuss major points. TEC reduces the instructor preparation time and increases management responsibility.

Experienced soldiers may complete a TEC lesson in 30 minutes and others may require longer, but time is unimportant if the soldier can pass the test. TEC lessons can be repeated as often as necessary to insure the desired level of mastery is achieved or as refresher training. After reviewing the TEC lesson, a soldier is posttested to determine his skills in his own MOS. He may also study other MOS lessons if interested. Each lesson must be mastered before the soldier moves on to the next step. The student does not compete with others. TEC deemphasizes failure. If the student does not get the right answer the first time, he is encouraged to repeat the process.

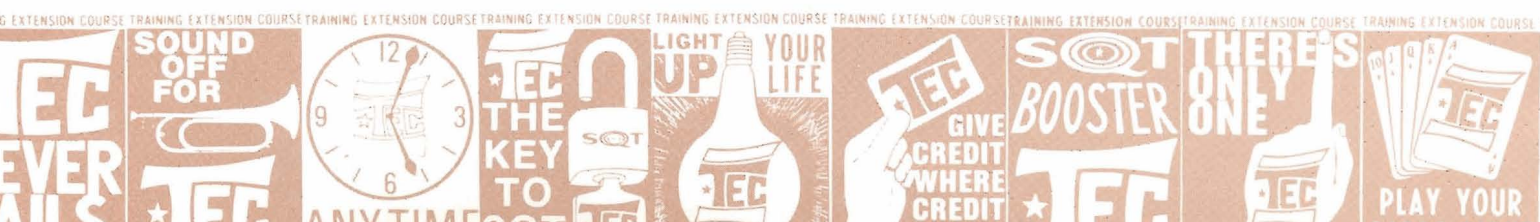
A study by the Army Research Institute (ARI), completed in January 1978, concluded: TEC teaches more effectively than conventional instruction. TEC-trained soldiers retain what they learn. Eight weeks after TEC instruction they performed better than soldiers who were tested one day after receiving conventional instruction. During limited evaluation, TEC users scored higher on SQTs than soldiers who did not use TEC. In addition to being more effective than conventional training, TEC training costs 16 percent less. TEC saves time because it gives the most information in the least amount of time. TEC teaches soldiers to do their jobs better and trains them for new skills, which increase chances for promotion. Soldiers learn faster, retain longer, and show higher motivation when they control their own rate of progress toward training goals. And the best training is that which comes closest to real world conditions. Soldiers who can relate to actual job performance will be motivated and will learn better. TEC provides every soldier a clear-cut progression pattern with maximum advancement opportunity throughout his career. The ultimate goal of TEC is well-trained soldiers.

A year ago, more than 29,000 Beseler Cue/See projectors were distributed to Active Army and Reserve Component units worldwide. At the time, a total of 1,404 TEC lessons were available for field use. These lessons had been prepared and distributed by each school to support proponent MOS. As of the first quarter of FY 81, the Extension Training Material Availability List showed that 2,089 lessons were available. Included in that total were 184 lessons prepared by the US Army Air Defense School.

The one-year projection for TEC is 4,320 lessons available for use in the field by September 1981.

According to results of a 1979 MILPERCEN survey of TEC usage, with 13,789 useable returns, more than 90 percent of combat arms officers are familiar with TEC and more than 80 percent of combat arms enlisted personnel are familiar with TEC. Seventy-eight percent of the noncombat arms personnel and more than 80 percent of the noncombat officers are familiar with TEC. Additional results of the MILPERCEN survey showed that 40 percent of the combat arms enlisted personnel did not use TEC in the 3 months prior to the survey and 54 percent of the noncombat personnel did not use TEC during the same period. However, results of the last six MILPERCEN surveys dating back to May 1977 show an increasing awareness of TEC and steadily rising usage of TEC, up 75 percent from May 1977 to February 1979 for enlisted noncombat personnel.

TEC is not being used more often for several reasons. Some soldiers surveyed did not know how to use the material or did not consider it important. A surprising number of soldiers did not know that TEC lessons were available at almost every unit in the Army worldwide, and others did not have access to the lesson during off-duty hours when they wanted them. A TEC Lesson Availability List is distributed quarterly to all TEC account holders. The point of contact for obtaining more information about the TEC program is the TEC Production and Distribution Office, AUTOVON 927-4868, Fort Eustis, Virginia 23604.



TARGET: the spoken word

by Lieutenant Colonel Don E. Gordon

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Army tactical communications will remain especially vulnerable to what the potential enemy calls 'radioelectronic combat' until commanders and staffs learn to use the radio in its proper role — as a cueing and prompting device, not as a telephone.

Editor's note: Although this article was published more than a year ago, the facts it presents are current and the information is of real importance to any combat unit.

Any future war against a major opponent is likely to find the Army's frontline communications severely crippled and even shut down for periods of time by the weapons and methods of electronic warfare (EW). The enemy will attempt to knock out radios, radars, and other electronic emitters with massive jamming, electronic deception, and destruction by fire — aided by direction-finding gear.

The infantry battalion can survive and fight on such a battlefield, but only if its peacetime training has thoroughly taken into account all of the ramifications of EW and integrated its elements into field exercises.

Let there be no mistake, our potential enemy is good at electronic warfare, especially jamming and the coordination of suppressive fires and radio direction-finding. But he is good mostly because the US Army is so weak in defending against EW.

Our defensive techniques, under the cumbersome title of electronic counter-countermeasures (ECCM), are, to put it candidly, horrible.

The Army has the best Communications Electronics Operation Instructions (CEOI) in the world, but we are mostly too lazy to learn how to use it and to insist that it be used correctly. Ignore the complaint that the CEOI is too cumbersome because it requires changing call signs and frequencies. There are both Army and Marine Corps battalions that have insisted on the training steps necessary to use their CEOI correctly and with relative ease. The CEOI is our first line of defense against enemy communications intelligence, direction-finding, and jamming.

The concept of a CEOI was conceived in World War II, after the British discovered one of the keys to the tactical success of the German Afrika Korps in the face of the numerical superiority of the British 8th Army: a special communications intelligence company, only about 100 men strong. This unit had been intercepting most of the key communications which fully revealed British battle plans. The signal intelligence company, for instance, gave the Germans the fortress of Tobruk on a platter.

While code-breaking played an important role in learning British secrets, an appalling amount of intelligence was also collected because the 8th Army constantly used the same call signs and frequencies. The British virtually provided the address and deployment of every tactical unit to the Germans. After being tipped off to this weakness, the British mounted a multibattalion attack by the Australian 9th Infantry Division to destroy the German signal intelligence company on 10 July 1942 at Tel-el-Eisa, near El Alamein, Egypt.

The hand-to-hand battle that ensued resulted in the death of most of the Germans, providing few prisoners but a wealth of captured documents and other material that was especially revealing. The impact of the discovery was so great that the British immediately effected a changing, randomly selected call sign and frequency system that has evolved into the present-day US CEOI.

The system demands that call signs and frequencies be randomly assigned and changed at least daily. The CEOI was not designed —contrary to the opinion of some — to harass the infantry, armor, and artillery. Rather, its purpose is to save lives and preserve combat power.

To understand why the CEOI is so important and why EW is considered an element of combat power, it is necessary to understand the important distinction between the US style of electronic warfare and radioelectronic combat (REC), the term used by the Soviet Army. This is no mere semantic difference but a precise distinction.

The Army integrates electronic warfare with combat intelligence and signal intelligence into a single system referred to as "combat electronic warfare and intelligence." The acronym is CEWI, pronounced "see-wee," and designates the battalions which now support the 82nd Airborne and 2nd Armored Divisions and which will soon be assigned to all divisions in the Army.

Each word of this new organizational and concept title was carefully selected to express the total integration of EW and intelligence and to insure that EW is not subordinated to intelligence. The concept was chiefly developed from the Army's analysis of the 1973 Mideast War.

As practiced by CEWI battalions, EW includes listening to enemy radios, watching his radars electronically, locating electronic emitters with direction-finding, and using electronic deception and jamming. Inherent in the process is deciding whether an enemy electronic target should be audited for intelligence, jammed to disrupt its capability, destroyed, or just left alone because it is unimportant.

In US doctrine, the principal purpose of jamming is not disruption but the development of communications intelligence. The main objective is to confuse or delay enemy communications to such an extent that his radio operators will make a lot of mistakes and thereby provide more intelligence. Few valid missions require us to block enemy communications with overwhelming noise jamming, although we can do this if necessary.

Instead, the CEWI battalion depends on the surgical use of spot jamming — the jamming of a specific channel or channels — rather than barrage jamming across a large portion of the radio band. Jamming is a key to unlock secure-to-plain text to get through the noise. When they do this, we stop jamming and listen. Our jamming is like an electronic piranha — it is short, clean, and vicious, ripping the guts out of a message.

We knock out key words or numbers, so that the enemy operator has to repeat the message over and over again. We want the station to stay on the air long enough to locate it with direction-finding. How long does that take? The enemy wishes he knew. In any event, spot jamming causes communications security mistakes and frustration among enemy commanders.

Enemy radars, on the other hand, are destroyed when located. It is necessary here to understand two important principles about EW and especially jamming. First, jammers can jam only receivers, not transmitters; second, direction-finding is very accurate against radars because of the characteristics of the radar wave, which is really a high-frequency radio wave. Direction-finding can provide a circular error probable (CEP) of about 100 meters against radars, but it is not as accurate against radio transmitters, where a CEP 15 times that large represents good performance under good conditions, using tactical equipment.

A CEP that large does not provide a target. If, however, the enemy operator refers to terrain features like woodlines, water, ridges, or elevations, the direction-finding operator will use basic map analysis and find the station as easily as if a street address had been provided. The enemy is not sparing in the amount of ammunition he will fire on a command post. US Army Training Circular 30-22, Battlefield Survival and Radioelectronic Combat (July 1977), is unclassified, easy to read, and explains how all of this works.

By contrast, the enemy depends on barrage jamming to keep numerically inferior Allied forces from coordinating their technologically superior weapons and command and control systems. This requires large numbers of cheap, rugged, high-power jammers. When enemy barrage jamming is combined and coordinated with suppressive fires targeted by direction-finding — especially multiple rocket-launcher fires — the effect on communications centers can be devastating.

The Soviet Army refers to this combination of jamming and suppressive fires as radioelectronic combat. Jamming is not used primarily to develop communications intelligence but to prevent communications within 10 to 20 kilometers of the breakthrough area or the frontline. Key communications centers at battalion, brigade, and division levels are disrupted with longer range spot jamming. Enemy jammers are thus assigned to special electronic warfare units or to signal units, not to intelligence units as is the case in the US Army.

In effect, the electronic battle becomes a fourth and invisible dimension to the battlefield in which a commander is already fighting for depth, width, and airspace. It is a dirty battlefield on which we had better train to fight if we are to win.

The CEOI, along with the good defensive communications tactics explained in US Army Field Manual 32-30, Electronic Warfare, Tactics of Defense, is designed to deny enemy direction-finding the aid of poor communications security. Only the combat arms commander can defend against REC — friendly CEWI battalions are designed to operate against enemy units. FM 32-30 and TC 30-22, previously cited, show how to do this and they belong in the field in daily training. The commander must insist on their use.

EW is taken seriously in the 82nd Airborne Division; it is a performance objective in the Army training and evaluation program (ARTEP). If a battalion in the division cannot perform satisfactorily in an EW environment during an ARTEP or field training exercise, it fails to meet a performance objective as surely as if it failed in any more-traditional combat arms objective. The division uses its 313th CEWI Battalion (airborne) to support both the friendly and the opposing force during training.

The 313th integrates all intelligence and electronic warfare disciplines — signals intercept,

ground surveillance radars, interrogation, imagery interpretation, reconnaissance, electronic sensors, and all jammers — into a single system supported by an intelligence communications system. This system supports the friendly unit during training. Other elements of the CEWI battalion simulate the opposing REC threat.

In experience gleaned from seven major exercises, the 82nd Airborne Division found that the single biggest problem that most infantry battalions have in an EW environment is lack of a strong net control station (NCS). The commander with little training and even less time tends to direct the net instead of a well-trained NCS radio operator. Army officers are not bashful about talking on the radio and, as a result, stations frequently jam one another because of mutual interference and create sloppy conditions ripe for exploitation by imitative deception.

Spot jamming is also effective against such nets and can be used to start a chain reaction in which one station after another switches from secure to plain text, back to secure, then to the alternate frequency. The lack of net coordination results in confusion and havoc. It is not uncommon to cause a radio net to become ineffective for about 15 minutes with no more than a single 15-second burst of jamming.

Frequently, net discipline is all but nonexistent. There are too many outstations on many very high frequency (VHF)/FM "push-to-talk" command nets — up to 56 in a brigade.

Too many times commanders use their radios rather than plans, orders, and standing operating procedures to explain the concept of operation. Radios are intended to direct the battle, not to substitute for effective staff procedures. The radio should send brief signals and cues for actions, but we sometimes seem to use it as a supplement to an oral history program or a telephone.

Armor units, in particular, use the radio to virtually describe the battle, compensating for the lack of all-around vision with a methodical and detailed explanation of the unfolding terrain.

Enemy REC and signal intelligence units would thrive on the mismanagement of our tactical communications. They can wreak havoc if we do not use good ECCM. If we do not authenticate our own signals, an enemy voice intercept operator who may speak English as well as or better than many of our own soldiers can become the "de facto" commander of a friendly company, battalion, or brigade.

Consider the all-too-common example during training exercises in which radio deception operators enter a friendly net by imitating one of its stations. In one exceptional case, a deception operator controlled an entire artillery battalion for 3 hours. The only operator in the entire net who was suspicious enough to request authentication, a female soldier working in the corps tactical operations center, was shouted down by other operators for tying up the net.

In another case which remains a classic, an engineer battalion built a portable bridge for the enemy over North Carolina's Pedee River. They acted on a single radio message — and an abundance of gullibility — advising that a party of visiting generals was soon to arrive to observe firsthand the work of this selected unit. The potential career benefits for all concerned were embellished and everyone hopped to and constructed the bridge in record time.

More commonly, a radio deception operator simply advises small elements to move weapons, a TOW antitank missile launcher, a section of artillery, or platoon defensive positions. As soon as one unit bites the bait and moves, the actions key radio activity by other units in the vicinity. Eventually, clarification of orders is requested, the entire net is bogged down in contradictory instructions and every station becomes a direction-finding target.

Deception techniques are especially effective against units which have strong, domineering commanders who insist on directing every aspect of the deployment down to platoon and squad

levels rather than using their own chain of command. Radio operators are not so obvious as to try and imitate the voice of the commander. They might simply enter a net to relay that "Colonel Smith exploded and wants the first platoon to move its TOW 200 meters further north and into defilade behind the woodline before he returns."

Any protest is answered with the suggestion that the lieutenant confront Colonel Smith personally when he arrives in 10 minutes. More often than not, the lieutenant moves the TOW. When officers are afraid of their commander, it shows up in stunts like this.

Another favorite trick is to enter the net and direct a lieutenant to meet the battalion commander at a specific location in about 20 minutes. Reportedly, the commander is arriving either by helicopter or truck so a suitable landing zone or intersection is selected. After the lieutenant departs, additional instructions are given to the platoon to effect its relocation. The lieutenant is then met by an "enemy" reconnaissance platoon — a favorite way of securing prisoners during exercises. This can all be avoided by simply using the correct authentication codes.

What too often occurs is that the adjacent platoon sees the first platoon moving its TOW, exposing a flank, and calls the company commander wanting to know if it, too, should move. The company commander, unaware of what is happening because his station is being jammed during the charade, tries to contact the battalion commander. Battalion remains ignorant of the "orders" from the "brigade commander" and tries to contact the brigade command post. The entire net lights up and the direction-finders have a field day. In a recent exercise, an entire Hawk air defense missile battalion moved 20 miles to a position of impotence based on a single unauthenticated radio call and had to use transportation from another battalion to do it.

Some commanders try to work their way out of these situations by yelling to "stop buzz," the Army-wide procedure to stop jamming or communications deception for exercise safety reasons. But there will be no "stop buzz" on the modern battlefield and that is why the 82d Airborne Division uses relatively free-play EW in ARTEP and field exercises.

One of the best allies a commander has on the electronic battlefield is the high-frequency (HF) radio set, the AN/GRC-122, -142, or similar radios, which can be used for radio teletype or AM voice. The AN/PRC-74, while not as widely distributed, is also a good HF AM voice radio. These radios are probably the most reliable and versatile radios now available for the electronic battlefield, but they are not secure in the voice mode.

The advantage of these HF radios is that the AM voice and Morse code (CW) modes are very difficult to jam if the proper antennas are used. Their strong ground wave has a range of about 50 miles. The HF radio is the mainstay of every major army except our own. In fact, the Army no longer teaches Morse code (except to Special Forces) and does not issue poles with which to construct directional antennas for HF systems.

One infantry battalion which did not satisfactorily complete EW performance objectives during its ARTEP did these things wrong, according to the evaluation report: the battalion responded to a bogus report (imitative deception) of a planned airmobile operation scheduled to place enemy troops on friendly flight strip 26. In response, the battalion commander held a company out of an upcoming attack to guard the airstrip and the attack failed. The battalion had failed to require the bogus radio station to authenticate and accepted as truth the bogus intelligence report supposedly sent by the brigade S2.

Later, a bogus station again passed itself off as one of the battalion's companies and reported an enemy armor threat approaching from the west. The actual company was being jammed and was unaware of the imitation of its call sign. All other stations on the net then tied up the net as effectively as jamming for the next 15 minutes, trying to confirm the report with battalion.

Battalion attempted confirmation with brigade and the scout platoon was redirected to provide observation to the west. In the meantime, the actual threat approached undetected from the east.

When the battalion command net, then operating in the secure mode, was jammed, some of the outstations reverted to plain text, suspecting that their secure equipment was faulty. These stations neglected to perform the simple test of momentarily disconnecting the antenna to determine if the interference was in the equipment or caused by jamming.

Other stations remained in the secure mode but could no longer communicate with those stations now switched to plain text. After several minutes, about half of the stations switched to the alternate frequency per standing signal instructions (SSI), while the rest stayed on the primary frequency. In effect, the NCS at no time had control of the net

and the battalion commander was out of touch with his unit for about 20 minutes.

Moreover, every major action and disposition conducted by this battalion was revealed to the enemy 15 minutes to 4 hours beforehand, due to the undisciplined communications chatter. Some locations were passed in clear; others were encrypted in easy-to-break and unauthorized codes. Every command post in the battalion and most TOW positions were located by references made to terrain features, roads, and bench marks.

In another instance, the battalion commander's radio operator accepted a bogus message purportedly sent from brigade, ordering a halt to the battalion's river crossing and preparation of defensive positions. Again, the operator did not authenticate. The battalion delayed the river crossing 4 hours until the commander drove back to brigade to confirm the original orders. Again, jamming had been used to prevent further discussion over the radio.

It must be understood, of course, that the tempo of an ARTEP focuses on many artificial performance objectives which makes a battalion vulnerable to manipulation of this type, and that in combat the instinct of survival quickly overcomes many of these lapses. Nevertheless, effective imitative deception cannot be discounted, for a single enemy success can cause the destruction of a battalion. The primary objective of deception is to delay and confuse, not to gain control.

More seriously, the plain text compromises in the ARTEP tests were so revealing that most company commanders would have led their units directly into preplanned artillery barrages. The communications security used by all three company commanders was totally unsatisfactory. All command posts would have been located and destroyed. Direction-finding would have assisted in locating units but was not needed because the chatter itself was so revealing.

The ARTEP lasted for 84 hours. During this period, the infantry battalion responded to the CEWI opposing forces unit, rather than its own battalion commander, at least half the time. The CEWI unit was not protected by assuming the role of exercise controllers. Yet, it consistently operated undetected within 2 to 5 kilometers of the tested battalion. The infantry battalion did not look for the "enemy" jammers using AT-784 homing loop antennas connected to AN/PRC-25 or VRC-12 radios.

At the end of the ARTEP, the CEWI platoon leader briefed the battalion commander. He did not tabulate the totals of abstract "practices dangerous to security," "communications security violations," or use other obscure and opaque language. Instead, the platoon leader unfolded his map and showed the battalion's commander and staff what the battalion looked like to the "enemy" hour by hour and day by day.

He provided a total picture by integrating radio intercept, interrogation, radar, sensors, remote imagery, and jamming.

Other battalions have trained for and excelled in achieving EW performance standards. During one major joint readiness exercise, the 2d Battalion, 505th Infantry, and the 313th CEWI Battalion jointly conducted a deception effort. In this effort, a reconnaissance platoon from the 313th simulated the entire infantry battalion for 2 days by using aggressive patrolling and manipulative communications deception.

A two-battalion "enemy" mechanized task force and coordinated air assault was wasted attacking the deception platoon, which melted into the woods of Florida's Eglin Air Force Base. Meanwhile, the infantry conducted an air assault of its own into the opposing force's division rear area. Jammers from the 313th were sling-loaded to accompany the infantry to disrupt the opposing force response.

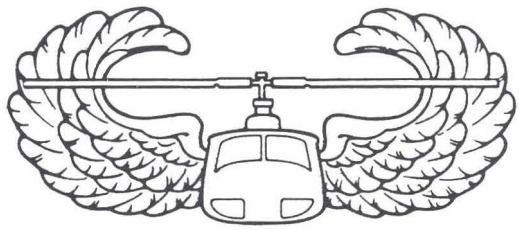
During all this, the opposing force was using every jammer in its division and a supporting airborne company to jam the deception platoon. In effect, a single platoon emasculated the combat power of a multibattalion task force while a light airborne infantry battalion destroyed the mechanized division's vital fuel and repair facilities.

Successful combat arms battalions must use good ECCM if they are to survive on the electronic battlefield. Specifically, they must keep communications short, less than 30 seconds. Command post antennas must be placed at remote locations at least 2 kilometers away.

Units must authenticate, use the CEOI, plan, use a communications standing operating procedure, and use their chain of command to function smoothly. Finally, it must be understood that the radio should be used as a signal device and not to conduct a conference.

VULCAN AIR ASSAULT AD OPERATIONS

by
Major Joseph G. Berger, Jr.
and
Captain Gregory F. Boron



In recent issues of AIR DEFENSE Magazine, photographs of various air defense weapon systems have been featured being air-transported. This might be the cause of some confusion, for although these weapons are being air-transported, they are certainly not being used in an "air assault" role. The difference between these concepts may be best described in the following terms: "Airmobile" is like a taxi service or long-haul freight line, moving equipment from one place to another. "Air assault," on the other hand, is the art of "assaulting" coordinated firepower directly onto an objective and sustaining combat or redeploying rapidly if required. Only one air defense battalion in the Army today can claim the distinction of performing a true air assault mission — the 1st Battalion (Vulcan) (Towed), 3d Air Defense Artillery, 101st Airborne Division (Air Assault) — the "I Strike" Battalion.

The 1st Battalion, 3d ADA is particularly well adapted for performing specialized air assault missions. The 101st Airborne Division (Air Assault) has an entire aviation group organic to its organization. This group consists of two UH-1 "Huey"/UH-60 "Blackhawk" battalions, one CH-47 "Chinook" battalion, and one AH-1 "Cobra" battalion. These 437 aircraft could lift an entire air defense battalion simultaneously if required. With the 1st Battalion, 3d ADA's special lightweight MTOE (44-435H), the aviation/air defense team can deploy forward area air defense firepower rapidly (well over 100 miles) without refueling.

The battalion itself has four line batteries and a headquarters battery. Each line battery has three 4-Vulcan platoons, with a total battery equipment authorization of 19 M561 Gama Goats, 12 Vulcans (Towed), 4 M151 jeeps, and five 3/4-ton trailers.

The significant fact is that all equipment may be transported by either Chinook or Blackhawk aircraft. With the exception of the FAAR, the heaviest piece of equipment weighs only 7,350 pounds.

Although the 1st Battalion, 3d ADA, is one of many divisional air defense battalions, several of the challenges faced are peculiar to operating in an air assault division. Airspace management, fire support coordination, and "normal" direct support (DS) missions are notably different.

In an aviation-intensive division, airspace management is a critical necessity. While there is still a great deal of work to do in this area, the division has enjoyed some degree of success coordinating flight patterns with fire support missions. A certain amount of coordination is also realized with the close air support provided the division by the Air Force. The air defense element at the DAME is responsible for providing weapons control status (WCS) and air defense warning (ADW), coordinating Hawk support with the ADA battalion, and providing some early warning to the ADA battalion. At the brigade tactical operations center (TOC), the air defense element coordinates Redeye and Vulcan coverage, passes WCS and ADW, and acts as a liaison between the supported brigade and the DS Vulcan battery.

This liaison element at the brigade plays a key role when the brigade is deployed as a separate task force, taking with it its "slice" of divisional field artillery, engineer, combat support, combat service support, and, of course, air defense assets. This is the normal manner in which the brigades are at least initially deployed. Usually, each brigade has a specific ADA battery that is its designated "slice" element. This allows the ADA battery the opportunity to know the brigade's SOP and,

more importantly, be a part of the "brigade family." In this deployment situation, the liaison section's role takes on increased significance. The liaison officer (LNO), usually dedicated to a specific brigade, is located with the ADA S3 office and performs the initial coordination necessary between the air assault brigade S3 and the Vulcan battery commander. He, too, is a member of the "family," knows the daily status of the Vulcan battery at any time, and can provide the air assault brigade S3 with timely air defense information.

Planning factors and execution of a battery and platoon operation will highlight still more differences. Perhaps the biggest difference in the planning and execution of an air assault operation is the enormous amount of liaison and coordination that must be accomplished prior to any operation. The overall responsibility for this task falls upon the air assault task force commander (AATFC) and his "slice" staff consisting of the following:

- Aviation liaison officers.
  - CH-47 battalion.
  - UH-1/UH-60 battalion.
  - AH-1 battalion.
- Air mission commander (AMC).
- Air defense fire support officer (ADFSO).
- Artillery fire support officer (AFSO).
- Air cavalry liaison officer (LNO).
- Air liaison officer (ALO).

The planning sequence is the same "reverse" sequence used in an airborne operation:

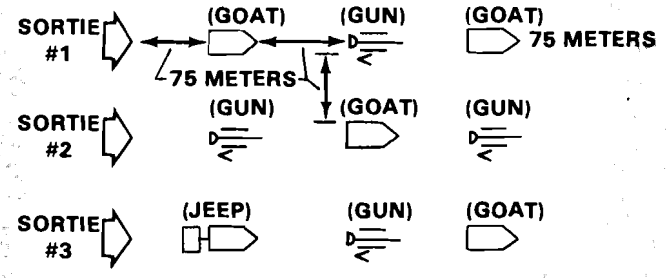
- Ground tactical plan.
- Landing plan.
- Air movement plan.
- Load plan.
- Support plan.

In the initial stage, the AATFC and his staff will design the ground scheme of maneuver similar to any conventional operation: what forces will be used in what capacity to take designated objectives. During this stage, the Vulcan battery commander will advise the AATFC on how the brigade's air defense assets may be best employed (Vulcan, Redeye, and FAAR). Detailed coordination follows, which entails the composition of the next three listed plans: landing, air movement, loading. This phase is completed at the task force's air-movement control (AMC) meeting. At this meeting, the Vulcan commander, S3s from the task force's battalions, and "slice" staff LNOs work out details such as:

- Unit and equipment priorities for air movement.
- Designated landing zones (LZs).
- Designated air-support ships.
- Pickup times.
- Control measures.
- Aircraft formation/number of ships/number of sorties.
- Pickup zone (PZ)/LZ control.
- PZ set-up and configuration.
- Movement, staging, and relief from present mission times.

All of the above must be accomplished in painstaking detail to insure a fully orchestrated delivery of all required firepower and support to the designated objective. Armed with this information, the Vulcan commander will brief his platoon leaders on their missions and movement plans. He will also direct the time and location for the staging area. This area should be concealed and as close to the PZ as possible. At the staging areas the squads prepare, rig, secure, and inspect their equipment for sling loading. Such activities as installation of the truss kit, covering all glass and lights, removing all canvas, securing loose items, taping and securing movable parts, and setting and rigging slings are performed in the staging area. An experienced crew, from a road-march configuration, can have its Vulcan ready for air assault in less than 10 minutes. While the battery is staging, the pickup zone officer (PZO) will be out on the PZ setting up for the pickup. At the appointed time, the Vulcan platoons will move to the PZ in a predetermined order. The PZO is responsible for insuring the order of lift on the PZ matches the order coordinated earlier with the Chinook LNO at the AMC meeting. An example of a platoon daylight PZ is depicted in the following illustration.

PICKUP ZONE DESIGN



Actions on the PZ are critical and must be precise; there is no time for indecision when a lift of Chinooks is hovering over the PZ. When conducting a lift of all battery firing systems, the battery executive officer makes an excellent PZO, and the battery headquarters section (at least 10 personnel) makes a good choice for pathfinder and

hookup personnel. When the aircraft are incoming to the PZ, the PZO establishes radio communications with the Chinook flight leader and coordinates the actions on the PZ. For each Chinook there is a three-man hookup team — an individual trained in air assault pathfinder techniques to guide and assist the aircraft pilot, a hookup man, and a "static probe" man used to dissipate any static charge that might have built up on the aircraft hook. The talent of quickly and effectively preparing and moving equipment from stage through PZ lift is the real force of the air assault unit. This skill must be constantly practiced, critiqued, and improved upon. No air defense unit can perform this as well as the 1st Battalion, 3d ADA, can. After the equipment is released on the LZ, the Vulcan's mission is much the same as any other divisional Vulcan mission —support the maneuver force and the task force commander's priorities. Additional problems sometimes ensue because of the large distances covered by the air move. More often than not, the firing battery will be air assaulted with a battery forward CP (a jeep w/RT 524) for control. The remainder of the battery headquarters section (five Gama Goats and trailers) will either be lifted at a later time or road marched to the objective. All in all, this is a very difficult operation to orchestrate!

Below: Three-man hookup team prepares Vulcan for airlift.

While similarities between the 1st Battalion, 3d ADA, and other divisional air defense units are many, it is in the distinct differences of air assault operations where we stand alone. The additional challenge of this exciting skill makes us unique. We work hard at perfecting those techniques and enjoy the challenge of being an important part of the air assault strike force.

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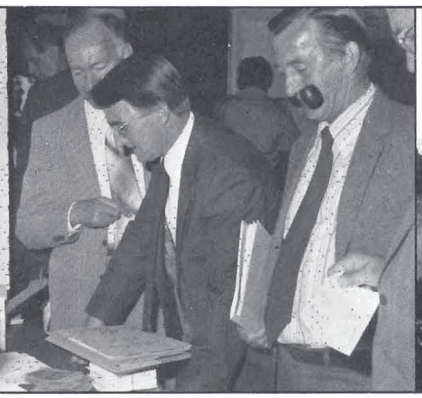
ADA COMMANDERS CONFERENCE



By Lieutenant Colonel Richard B. Wessling

The screen exploded with action as aircraft after aircraft was shot out of the sky by our air defense artillery weapons. For 3 minutes, the viewers' eyes were riveted to the screen as they witnessed the lethality of our weapon systems. Thus began the biennial ADA Commanders Conference, which would hammer on the need for a viable Air Defense Artillery Branch.

A total of 282 attendees participated in the conference. This included representatives from many field units, including the 32d AADCOM, 38th ADA Brigade, and FORSCOM, along with instructors from other service schools and key staffers from TRADOC activities. The Reserve Components were well represented and contributed to the discussion and mission. The conference provided a forum for the introduction of new concepts and every attendee saw the future direction of air defense artillery. The facts, assumptions, and inferences that led to our planning were presented in detail.

The conference opened with a warm welcome given by BG Archie S. Cannon, Jr., assistant commandant of the US Army Air Defense School (USAADS). Brigadier General Cannon then presented the keynote address, "Standarization." It was the beginning of 2 days loaded with activities, briefings, seminars, and displays.

CONFERENCE PRESENTATIONS

Directorate of Combat Developments (DCD)

Three DCD briefings set the theme of the conference. The first was on the Threat. It covered both qualitative and quantitative considerations of Threat aircraft characteristics, employment concepts, and future Threat developments. The data presented were based on a complete mission analysis. The air threat is formidable but not without areas of weakness. These areas of weakness can be exploited by our current and proposed systems.

The next briefing was a review of the factors affecting development of the Army 86 Program. The rationale for the ADA force structure for the next decade was explained. The logic for each force structure and organizational decision was also explained. Both the proposed and approved concepts were presented to provide an insight into the study effort that guided decisions on organizational and operational requirements of the future.

The third briefing highlighted integration of the new systems into air defense artillery.

Directorate of Training and Doctrine (DOTD)

The Tactics and Doctrine Division, under DOTD, develops concepts and establishes doctrine in coordination with the Directorate of Combat Developments. The subject matter experts in this division develop and teach doctrine in professional development courses. Instructional methods provide interaction with the student body so ideas can be exchanged with students from the field. New initiatives in electronic warfare training were announced. Electronic warfare will not be taught separately and will be reinforced in practical exercises.

A briefing on FORSCOM ADA units emphasized quick, smooth integration into the European Theater with total accommodation to the gaining air defense region command. The key to success of this integration is to standardize our missions clearly. This action is already under way. Of equal importance is to acquaint FORSCOM commanders with the uniqueness of air defense artillery operations and the requirement that air defense be under a single commander to maximize the effectiveness of all contributors to the air defense mission. Ground gaining arms receive air

defense from all sources: the Air Force, Navy, Marine Corps, and Army. Consequently, training in CONUS must reflect the procedures that will be found in the NATO environment. We will not have time to reorient our training in the event of hostilities. Division and corps commanders must realize that ADA elements will not be employed in Europe independently. Rather, air defense coverage involves mass, mobility, mix, and integration of air defense weapons under a command control system capable of directing fires and procedural control. Once the instructional courses are brought into this line of reasoning, then we must share our ensuing views and directions with the field commanders we are charged with supporting.

The last briefing was an overview of our combined arms instruction in the professional development courses. Our officers are required to be combined arms qualified. The new thrust in officer training emphasizes infantry, armor, field artillery, and combat engineer coordination.

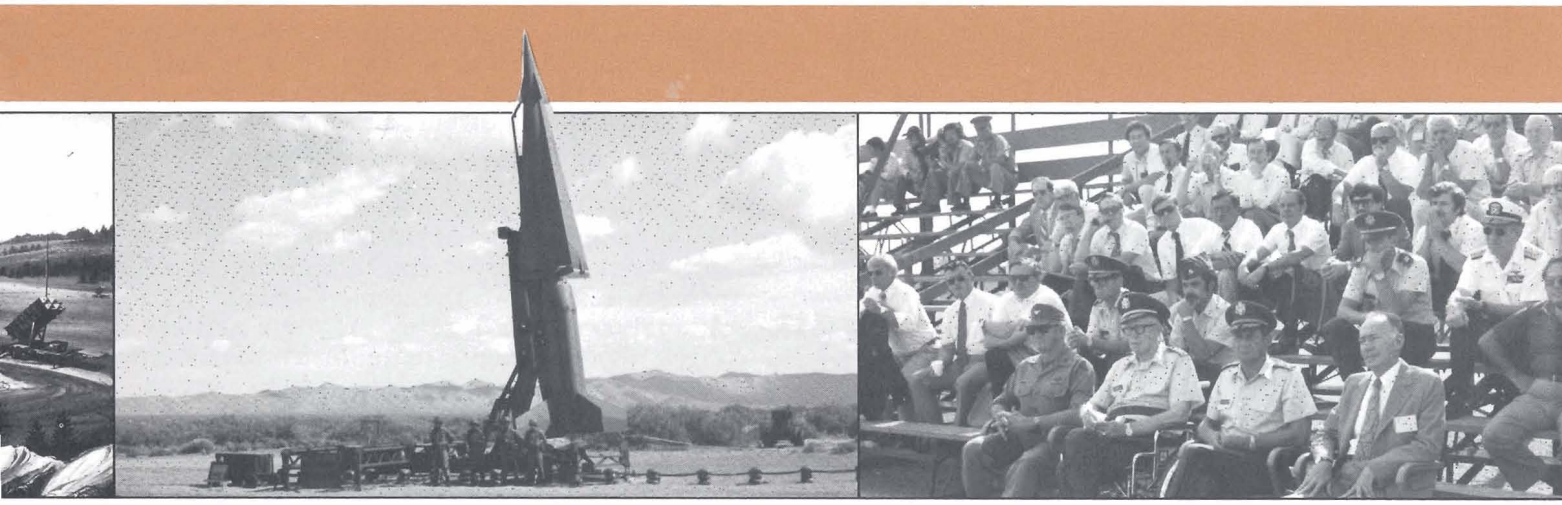
Directorate of Training Developments (DTD)

First, a comprehensive look at training developments was presented. A brief overview of ADA interaction with the Multiple Integrated Laser Engagement Simulator (MILES) and Air-to-Ground Engagement Simulation (AGES) techniques was also presented.

The DTD briefing also covered a wide variety of projects under development. The self-pacing program was reviewed, including revisions to improve soldier performance. An update on the ADA interface with the National Training Center was included. Training devices and simulators for both current systems and new systems were covered. An overview of the proposed training literature program was provided, which indicated a reduction in the number of publications as a result of an analysis of field needs. The briefing ended with a review of actions under study to revise our professional development courses.

1st Air Defense Artillery Training Brigade

The brigade commander provided a profile of the one station unit training (OSUT) soldier. This presentation emphasized that the trainee receives 60-65 hours of training a week, thereby changing a civilian into a soldier. The training reinforces basic soldier skills, provides initial skill in a specific MOS, builds self-confidence, upgrades reading skills, and provides the commander with an eager young soldier willing to try. But commanders in the field don't seem to have this perception of our newly trained soldiers. The reason is the change in atmosphere from the OSUT setting to the field setting. The soldier doesn't have the close association with an instructional staff to guide and encourage his performance in the field unit. It is important that the trainers in the gaining units really care, and most of them do. Greater self-confidence and the resulting improved performance of duty require the guiding hand of leadership. If it is provided, the new soldier will react and will strive for proficiency.



US Air Force

The United States Air Force provided an exceptional briefing on the Airborne Warning and Control System (AWACS) and a demonstration of the E3A (Sentry) aircraft. The capabilities and limitations of employment of this system were covered in precise terms. Also discussed were the data that the AWACS can provide to the Army air defense commander in a field setting. Attendees were transported to the El Paso International Airport for a walk-through briefing of this highly

sophisticated communications control and warning system. Conference directors were grateful to the 532d Airborne Warning and Control Wing of Tinker Air Force Base, Oklahoma, for this most informative presentation.

Military Personnel Center (MILPERCEN)

Attendees were given a detailed briefing on the state of the Air Defense Artillery Branch. The briefing covered our history, current strength, and projected strength against the background of officer specialty codes. The branch has achieved excellent results in promotion board and senior service school selections. A special presentation of the project managers program was provided, and career enhancement aspects of the program were highlighted. The question and answer period that followed the Officer Personnel Management System (OPMS) briefing was intense, sincere, and honest. It was emphasized that soldiers have a responsibility to help develop their potential to gain maximum benefits from assignments.

DISCUSSION — US and allied participants confer informally with the commanding general.

Military Police School

The briefers emphasized ADA site security requirements. The training program for the enlisted soldier assigned to military police duties must embrace all areas of military police work. The ADA units can help in this requirement. The assistance needed is a total training program in military police duties, which can be found in Training Extension Course materials or the Army correspondence course program. Security personnel must be integrated into the unit, but it must be remembered that these soldiers are a part of the *special team*. However, the individual soldier's contribution should not be considered as more or less than any other member of the ADA unit.

TRADOC System Managers

DIVAD Gun. The DIVAD Gun briefing highlighted the need for this type of system to meet the threat of the future. The presentation covered the general characteristics of the proposed system, proposed organizational structure, and life cycle system management decision points. Also addressed were the resulting decisions on training materiel and doctrinal concepts for study. Fielding plans were addressed in detail.

PATRIOT. This briefing highlighted the proposed organizational structure, system characteristics, system design requirements, software requirements, and training developments under way to field the system. Test results were reviewed. Study data concerning the organizational and operational requirements that drove the decision making process were presented in concrete terms.

STINGER. "We are well pleased with the capabilities of this system" was the tone of this message. The fielding plan, training program, training devices, and simulators were discussed, emphasizing the total commitment of the Army to the introduction of this weapon system to the field. It is the first of the new family of ADA weapons to be introduced that will enhance our mission of providing air defense for the ground gaining arms.

ROLAND. This briefing highlighted the significant activities completed to date to field the system. Standardization of NATO equipment was one of the reasons for fielding this foreign made weapon. A review of the organizational and operational concepts, training program, and key materiel development considerations was presented, including the requirement for a sustaining base here in CONUS to support the oversea manpower rotational requirements.

United States Army Air Defense Board (USARADBD)

The technical and practical problems of developing a test program were covered by the President, USARADBD, who pointed out that the responsibility of a USARADBD assignment is an individual challenge. Data collection, data analysis, and findings are based on objective criteria. Man-machine interface, equipment design characteristics, performance levels of the equipment, the equipment/soldier interface, and soldiers themselves are all subject to accurate measurement. The data collection is no accident but rather is based on a deliberate plan of action to learn whether the equipment's design characteristics and the actual performance are compatible.

11th Air Defense Artillery Brigade (Prov)

The brigade presentation was introduced with the 11th ADA Brigade chorus singing an adaptation of "Rhinestone Cowboy." It was called, "The Air Defense Cowboy." It was a good attention-getter and a welcome contrast in the conference presentations. What followed was in a serious vein. It covered ideas, concepts, and

activities necessary for an ADA unit or organization to meet the air defense needs of the Rapid Deployment Force (RDF) anywhere in the world. This caused the attendees to reflect on many aspects of operational requirements, transportability, equipment delivery, troop movements, and logistical support that would face the departing unit and the host nation.

Two presentations were of major concern to the Commandant, USAADS. They dealt with the integration of FORSCOM ADA units into the NATO arena and the activities required to support the RDF with Army ADA. These issues are considered high priority and were the main topics of later discussion.

OTHER ACTIVITIES

Commanders of battalions, groups, brigades, the 32d AADCOM, or their representatives, were invited to attend a special seminar to discuss the information provided by the conference, to gain field feedback, and to present fresh insights on their critical issues and needs. This opportunity for interchange allowed all participants to express concern over doctrinal issues, standardization, ammunition, and the need for a united effort by air defenders to educate field commanders in the capabilities and limitations of our systems and doctrine, especially in the light of practical expectations.

An executive session hosted by the Commandant, MG John B. Oblinger, Jr., was held at the conclusion of the conference for all field commanders present from battalion to AADCOM level.

While the executive session was conducted, a broad offering of seminars was provided to the other attendees. Each covered a topic area that has received considerable attention from the field during the past 2 years. This array of 1-hour seminars included the following areas of interest:

- United States Army Sergeants Major Academy.
- Learning Center, Organization and Function.
- Combat Developments, a Detailed Look.
- Targets, ARTEPs, and ASP Initiatives.
- Doctrine and Literature Program.
- Air Defense Board Issues and Projects.
- Feedback Systems from the Field.
- Training Strategy for the 1980s.

On the last day of the conference, an area was set aside where contractors displayed the latest technology in materiel, training devices, simulators, and practical application of training developments and educational methods in current and future training programs. The FMQ 117A radio-controlled miniature aerial target was displayed for examination. The Stinger weapon was displayed along with brochures to explain its use. Patriot was represented by a scale model of the system. Roland was represented by a display of the missile and its components. The DIVAD Gun display consisted of a contractor film from each candidate system. Trainers and training developers were introduced to "plasma panel" technology for use in target acquisition for fire control systems. Literature on the use of an electronic simulator panel display trainer offered new ideas for both institutional and extension training for operator and maintenance personnel. The PLATO system was demonstrated as a candidate for computer-assisted instruction. The system is already in use at Fort Meade, Maryland, to teach basic skills. Attendees were introduced to the Weaponeer, a high-validity simulator for training in the basics of rifle marksmanship. The 1st ADA Brigade set up a performance-paced individual learning center to demonstrate the integrated use of training publications and training equipment, and the latest in educational technology equipment.

SUMMARY

The conference was classified SECRET to permit the presentation of all aspects of the latest concepts, doctrine, training developments, and materiel development activities. Each presentation was concerned with the Threat. Many ongoing activities to improve the capabilities of field units were discussed in detail to provide an understanding of those efforts and of the limitations that bear on development processes.

Honest, frank, and candid opinions were exchanged regarding the direction of ADA efforts to meet the needs of field units. The look into the future was tempered with an over-the-shoulder look at the lessons we have already learned. Hopefully, attendees from the field discovered that USAADS is moving ahead in a systematic and coordinated manner with valid plans to provide air defense to the total force.

Participants from the School were reminded that the field commanders need answers today to problems that are real today. They are anxious for well-conceived and tested equipment and doctrine, and for trained personnel. These commanders should feel assured that the ADA Commanders Conference goes a long way toward advancing the understanding and initiatives that will culminate in their needs being fulfilled.

LIEUTENANT COLONEL WESSLING *is the Director of Evaluation and Standardization (DOES) of the US Army Air Defense School. He served as coordinator of the ADA Commanders Conference, assisted by the DOES staff.*

IMPROVED ELECTRONICS TRAINING » Keeping up with Technology

by Frank R. Egner

It's difficult to imagine our lives today without electronics. From small children's toys to the most complex weapon systems, electronics has a large part to play. In particular, the advancement of solid-state technology has created a tremendous growth in the electronics field. Although the fundamentals of electronics are the same, electronic technicians need to use new techniques and develop new thinking because increased knowledge has resulted in miniaturization and the modular concept.

The move toward modular design means that maintenance is performed largely by modular replacement. This would seem to be easier for the field technician; however, the opposite is true. The skill required to locate the defective module in minimum time without judgment error presents training problems for the beginning technician. He must be able to use various test instruments and correctly interpret the indications provided by the test.

This is of concern to the air defense community. An enormous amount of money is being spent to modify or replace air defense weapons with systems that use the latest electronic technology. To maintain these systems in operational condition, the Army needs knowledgeable and competent technicians now more than ever.

It is easy to conclude that the new-generation technician (whose primary maintenance function is locating and replacing defective circuit modules) needs less training and skill than his predecessor (who was required to locate and replace individual defective components). This is a false conclusion. However, it has resulted in a reduction of time allocated for training in the fundamentals of electronics.

It *still* takes time to train competent technicians in the use of test equipment and analyses of test indicators. Modern electronic equipment is more complex and contains many more circuits than earlier equipment using discrete components. Most modern electronic systems contain miniaturized circuits using transistors and integrated circuits. Operating voltages and signal levers are much smaller, requiring more precise tests, measurements, and diagnoses. The increased circuitry provides more accurate operations but includes more modules and interconnections. The technician must be able to analyze the system diagrams, make appropriate tests, analyze the symptoms, and make the determination as to which module or circuit is causing the malfunction. He is expected to make the correct decision, too. So you see, the duties of the electronic technician servicing modern military equipment are surely not easier nor do they require any less skills than previously.

The need to modernize the electronic training conducted at the Missile Electronics Division of the US Army Air Defense School, Fort Bliss, has become evident. Training must be oriented toward the needs of the technician who will be primarily concerned with maintaining modern military electronic systems. The Missile Electronics Division is undergoing a complete revision of its training programs, equipment, and literature to meet these needs. The end result will be a better-trained, more knowledgeable technician for the field.

The laboratory equipment previously used for training in fundamental electronics and basic circuits is being completely replaced. The new equipment, presently on order, will be phased-in when it arrives later this year. Figure 1 shows the basic console that will be available for each resident student. It will permit individual application and maximum training capability. The unit (NIDA trainer model 130) is referred to as the test console. The original design has been modified to meet training needs of the School.

The test console connects to the 120-volt ac line and provides output voltages for all training circuits. High voltages (0 to 250 volts dc) at 40

milliamperes for vacuum tube circuits and low voltages (0 to 24 volts positive and negative) at up to 1 ampere for solid-state circuits are available. Each output can be preset to any of five fixed voltage and four current levels. Each output is continuously variable over its entire voltage and current range. A switched voltage and current meter permits monitoring outputs individually. All outputs are short-circuit protected, eliminating breakdowns due to student errors.

The test console contains three positions to accept circuit card plug-in units. Each card has its required voltages applied through a system of pin connectors. Cards can be interconnected through the console to provide a wide variation of circuit configurations and testing applications. On the front panel below the circuit cards is a lockable switch compartment. There are 10 three-position switches for each card that are used to set up various circuit conditions and to switch select a variety of circuit faults for troubleshooting practice.

Circuit cards have been designed to include all the basic and advanced circuits taught previously, plus new circuits on solid-state devices. Each circuit card is a complete circuit, made of a durable material to withstand continued student use. Most of the parts are permanently mounted. They follow the modular concept where inputs-outputs can be tested and complete circuit testing and analysis can be covered in detail. Some cards have plug-in tubes and transistors. Circuit cards are available from the very basic concepts to three-card combination circuits. Cards fall into these categories: (1) basic components, (2) dc circuits, (3) ac circuits, (4) RC and RL filter circuits, (5) solid-state circuits, (6) vacuum tube circuits, (7) integrated circuits — linear and digital, (8) AM and FM receiver circuits, (9) logic circuits — basic and advanced, and (10) special semiconductor circuits.

The test console and circuit cards are tailored for students at the technician level. The unit and cards expose students to the modular concept, using classical vacuum tube, solid-state, and integrated circuit applications. The unit permits observation, investigation, adjustment, and troubleshooting training.

Modernization of the training facilities in the Missile Electronics Division is going beyond the

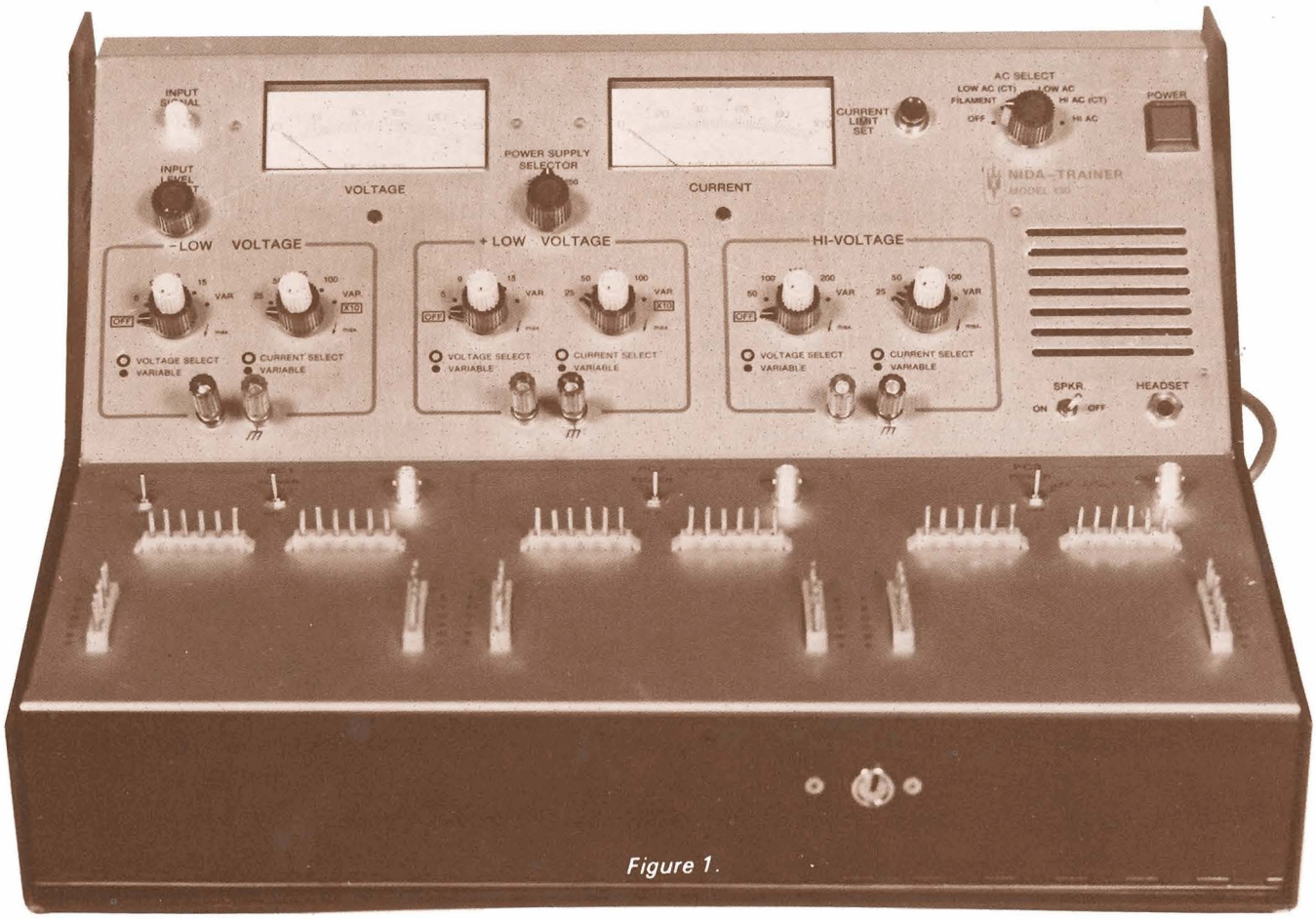


Figure 1.

training equipment. The training literature and methods of instruction are also being revised. The platform instructor, conducting lock-step instruction through conference and laboratory experiments, will soon be a thing of the past. Training literature, arranged in separate subject modules, will be ready when the equipment arrives, and the revised training programs will begin at once.

The instructor will be a helper — supervising the program and assisting students when required. Each student will study the modules individually and at his own pace. Yes, it's Criterion Referenced Instruction (CRI). More than 100 subject modules are planned to cover all the subjects previously taught, plus a few new ones. The capabilities and applications of this system are unlimited.

The arriving student will be issued a course map outlining the modules he must complete according to the requirements of his MOS. Following his course map, he selects the first module and begins. The map may provide alternate routes that permit the student some choice in the order in which he takes the modules. However, he must complete all subjects on the map to complete the course. Then he will continue with specialized equipment and train on the systems of his MOS.

Each module begins with an overview of the module's content. This is followed by the specific performance objectives. The objectives state in detail exactly what the student must be able to do upon completion of the course. The training activities are listed next. This is the study material or text and descriptions. The texts being used are Electricity 1-7 and Electronics 1-7, published by the Hayden Book Company, Inc. Each module has specified reading assignments in the textbooks, but additional text material and supplemental descriptions can be found in the module booklet. Frequent questions are included in the material to test the student's understanding as he progresses. In some cases, the text may be supplemented by video tapes or other audio-visual material.

Each reading assignment is followed by laboratory work. Using the test console and specified circuit cards, the lab worksheet exercise provides the practical application of the subject being studied. Using meters, oscilloscopes, and signal generators, the student makes tests and measurements showing circuit operation. Indications are recorded and checked with the instructor. Errors are discussed and the exercise is repeated as necessary.

Experiments include circuit set-up and initial adjustment, use of appropriate test instruments and circuit measurements, and diagnosis. Use of the circuit diagram is stressed in selecting test points for the measurements. Any discrepancies are noted by the instructor, who then guides the student through a review of equipment use to insure he can perform correctly.

When the student has completed all the material and exercises in the module, he asks the instructor for the module test. Module tests are performance oriented. He must perform correctly, obtaining the correct results as specified in the performance objectives. Failure of any part returns the student for further study in the module. Only when the student can perform as specified does he get credit and proceed to the next module. Therefore, when a module is completed and credited, it is evidence that the student has met the module objectives, learned the material to required levels, and demonstrated his ability to perform the prescribed standards. The test provides go or no go results. Guessing and cheating are virtually eliminated.

In summary, the changing technology and applications in electronics necessitate changes in the training of military electronic technicians. Because the Army depends on the operation and maintenance of modern electronic systems for the defense of the nation, training facilities of the Missile Electronics Division of the US Army Air Defense School are changing to provide the skilled electronic technicians needed to maintain this equipment in the field.

We instructors are willing to accept change and will do our utmost to make the concept work even better than predicted. After all, our very survival could depend on it.

MR. EGNER *has been an instructor in missile electronics for the past 14 years. He is retired from the Army and has more than 40 years of Federal service. He is a Certified Electronics Technician (CET) and a CET Test Administrator. Mr. Egner holds an FCC second class commercial license with radar endorsement and is a part-time electronics instructor at El Paso Community College, El Paso, Texas.*

DEPARTMENT OF THE ARMY

Lineage and Honors

4th AIR DEFENSE ARTILLERY

Constituted 1 June 1821 in the Regular Army as the 4th Regiment of Artillery and organized from new and existing units with Headquarters at Pensacola, Florida

Regiment broken up 13 February 1901 and its elements reorganized and redesignated as separate numbered companies and batteries of Artillery Corps

Reconstituted 1 July 1924 in the Regular Army as the 4th Coast Artillery and activated in the Panama Canal Department

Regiment (less Headquarters and Headquarters Battery) disbanded 3 October 1944 in the Panama Canal Zone

After 3 October 1944, the 4th Coast Artillery underwent changes as follows:

Headquarters and Headquarters Battery, 4th Coast Artillery reorganized and redesignated 1 November 1944 as Headquarters and Headquarters Battery, 4th Coast Artillery Group
Reorganized and redesignated 2 January 1945 as Headquarters and Headquarters Battery, Harbor Defenses of Balboa
Inactivated 15 January 1947 at Fort Amador, Canal Zone
Consolidated 28 June 1950 with Headquarters and Headquarters Battery, 4th Antiaircraft Artillery Group (see ANNEX 1) and consolidated unit designated as Headquarters and Headquarters Battery, 4th Antiaircraft Artillery Group
Activated 1 September 1951 at Ladd Air Force Base, Alaska
Inactivated 15 January 1958 at Ladd Air Force Base, Alaska

Regiment (less Headquarters and Headquarters Battery) reconstituted 12 October 1944 in the Regular Army and consolidated with the 4th Coast Artillery Battalion (constituted 3 October 1944 in the Army of the United States) and consolidated unit designated as the 4th Coast Artillery Battalion
Activated 1 November 1944 in the Panama Canal Zone
Disbanded (less Batteries A and D) 1 February 1946 in the Panama Canal Zone (Batteries A and D concurrently redesignated as Batteries A and D, Harbor Defenses of Balboa; inactivated 15 January 1947 and 15 May 1950, respectively, in the Panama Canal Zone)
4th Coast Artillery Battalion (less Batteries A and D) reconstituted 28 June 1950 in the Regular Army; concurrently, Battalion and Batteries A and D, Harbor Defenses of Balboa redesignated as the 4th Coast Artillery (less Headquarters and Headquarters Battery); elements of the former 4th Coast Artillery redesignated as follows:

4th AIR DEFENSE ARTILLERY

1st Battalion consolidated with the 4th Antiaircraft Artillery Automatic Weapons Battalion (active) (see ANNEX 2) and consolidated unit designated as the 4th Antiaircraft Artillery Automatic Weapons Battalion

2d Battalion as the 20th Antiaircraft Artillery Battalion

3d Battalion as the 44th Antiaircraft Artillery Battalion

After 28 June 1950, the above units underwent changes as follows:

4th Antiaircraft Artillery Automatic Weapons Battalion redesignated 31 July 1940 as the 4th Antiaircraft Artillery Battalion
Inactivated 16 June 1957 in England

20th Antiaircraft Artillery Battalion redesignated 13 March 1952 as the 20th Antiaircraft Artillery Gun Battalion
Activated 8 May 1952 at Fort Lewis, Washington
Redesignated 1 May 1953 as the 20th Antiaircraft Artillery Battalion
Inactivated 20 December 1957 at Phantom Lake, Washington

44th Antiaircraft Artillery Battalion redesignated 1 April 1951 as the 44th Antiaircraft Artillery Gun Battalion and activated at Fort Stewart, Georgia
Redesignated 3 August 1953 as the 44th Antiaircraft Artillery Battalion
Redesignated 22 March 1955 as the 44th Antiaircraft Artillery Missile Battalion
Inactivated 1 September 1958 at Niagara Falls, New York

Headquarters and Headquarters Battery, 4th Antiaircraft Artillery Group; 4th and 20th Antiaircraft Artillery Battalions; the 44th Antiaircraft Artillery Missile Battalion and the 4th Field Artillery Battalion (organized in 1907) consolidated, reorganized and redesignated 1 September 1958 as the 4th Artillery, a parent regiment under the Combat Arms Regimental System

4th Artillery (less former 4th Field Artillery Battalion) reorganized and redesignated 1 September 1971 as the 4th Air Defense Artillery, a parent regiment under the Combat Arms Regimental System (former 4th Field Artillery Battalion concurrently reorganized and redesignated as the 4th Field Artillery--hereafter separate lineage)

* * *

4th AIR DEFENSE ARTILLERY

ANNEX 1

Constituted 5 August 1942 in the Army of the United States as Headquarters and Headquarters Battery, 4th Antiaircraft Artillery Automatic Weapons Group

Activated 24 August 1942 at Camp Stewart, Georgia

Redesignated in the fall of 1943 as Headquarters and Headquarters Battery, 4th Antiaircraft Artillery Group

Disbanded 9 December 1944 in Italy

Reconstituted 28 June 1950 in the Regular Army

ANNEX 2

Constituted 16 December 1940 in the Regular Army as the 3d Battalion, 95th Coast Artillery (Antiaircraft)

Activated 17 April 1941 at Camp Davis, North Carolina

Reorganized and redesignated 12 December 1943 as the 866th Antiaircraft Artillery Automatic Weapons Battalion

Inactivated 30 September 1946 on Luzon, Philippine Islands

Redesignated 13 October 1948 as the 4th Antiaircraft Artillery Automatic Weapons Battalion

Activated 15 January 1949 at Fort Bliss, Texas

* * *

CAMPAIGN PARTICIPATION CREDIT

War of 1812
Louisiana 1815

Indian Wars
Creeks
Seminoles
Modocs
Little Big Horn
Nez Perces
Bannocks

Mexican War
Palo Alto
Resaca de la Palma
Monterey
Vera Cruz
Cerro Gordo
Contreras
Chapultepec
Tamaulipas 1846

4th AIR DEFENSE ARTILLERY

Civil War
Peninsula
Shiloh
Valley
Manassas
Antietam
Fredericksburg
Murfreesborough
Chancellorsville
Gettysburg
Chickamauga
Chattanooga
Wilderness
Spotsylvania
Cold Harbor
Petersburg
Shenandoah
Nashville
Appomattox
Virginia 1861
Virginia 1862
Virginia 1863
Virginia 1864
Virginia 1865
Mississippi 1862

World War II
American Theater, Streamer without inscription
Leyte
Ryukyus
Tunisia
Sicily
Naples-Foggia
Rome-Arno

Vietnam
Counteroffensive, Phase II
Counteroffensive, Phase III
Tet counteroffensive
Counteroffensive, Phase IV
Counteroffensive, Phase V
Counteroffensive, Phase VI
Tet 69/Counteroffensive
Summer-fall 1969
Winter-spring 1970
Sanctuary Counteroffensive
Counteroffensive, Phase VII
(other campaigns to be determined)

DECORATIONS

Valorous Unit Award, Streamer embroidered SAIGON

Meritorious Unit Commendation, Streamer embroidered VIETNAM 1968-1969

BY ORDER OF THE SECRETARY OF THE ARMY:

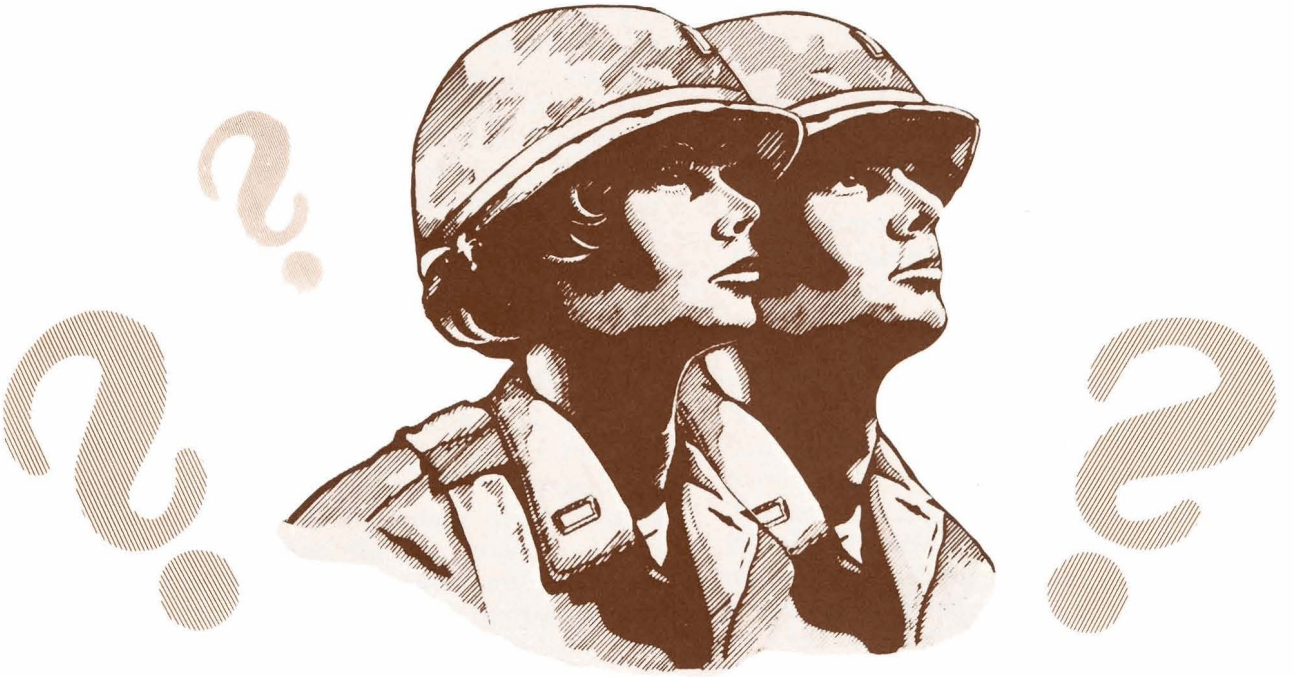
VERNE L. BOWERS
Major General, USA
The Adjutant General

DIVAD GUN ORGANIZATIONAL UPDATE

The division air defense battalion organization depicted in the diagram appearing on page 29 of the Oct-Dec 80 issue has since been modified. It now includes a second Active Army Chaparral battery for European battalions and an additional Reserve round-out Chaparral battery for the remaining SHORAD battalions. Each gun battery will have a Stinger platoon, and one Chaparral battery will have four Stinger sections. When implemented, MANPADS assets assigned to maneuver units of the division will be consolidated within the divisional SHORAD battalion.

A detailed article on organization of the ADA Battalion (AIM DIVISION), to include consolidation of Stinger, will be published in the next issue of AIR DEFENSE Magazine. Consolidation of Stinger in the separate brigades/ACR will also be addressed.

WHAT DO YOU DO NOW,



LIEUTENANT?

Prepared by Tactics Department, USAADS

Major Glen J. Meigel
and
Captain Antonio D'Andrea

OVERVIEW:

This article details one way in which a platoon RSOP might be conducted. The operation of moving a platoon depends upon such individual factors as distance, time, and the specific tactical situation. In addition, requirements concerning specific equipment to move, ammunition, local security, and other factors depend on established unit SOP and vary from theater to theater. Therefore, the scenario depicted should be used as a guide and modified to fit specific circumstances.

SITUATION:

First Lieutenant Brown is assault fire platoon (AFP) leader of Battery C, 1st Battalion (Improved Hawk), 48th Air Defense Artillery (Square). His battalion has been involved in combat for the past several hours and, recognizing that movement is required to enhance survivability and continuity of the mission, the battery commander decides that Battery C will displace to an alternate position. After battalion clearance, he briefs his key personnel on the reconnaissance, selection, and occupation of position (RSOP) and issues a movement warning order. The order makes Lieutenant Brown responsible for the RSOP party and positioning the AFP.

SOLUTION:

Lieutenant Brown recognizes that the RSOP process must be part of every Hawk unit's SOP and must also be adaptable to each of the ways a unit might move — by elements of a platoon (infiltration), by platoon, or by battery. In a combat environment, Hawk units will be continually moving to perform their missions and survive on the battlefield. A Hawk unit can perform its mission only when in position and ready to fire, and time required for movement is out-of-action time. Therefore, a Hawk unit must be able to move into a secure position and regain operational status in the shortest time possible.

Lieutenant Brown reviews the basic actions to be considered in conducting an RSOP:

- Issue the movement warning order.
- Plan the reconnaissance.
- Brief the next in command/issue orders to individuals concerned.

- Make the reconnaissance and select positions.
- Plan the occupation and prepare the position for occupation.
- Move the unit to selected position area.
- Occupy, organize, and improve the position area and initiate action according to unit standing operating procedures (SOP).

MOVEMENT WARNING ORDER:

Lieutenant Brown returns to his platoon and verbally issues a platoon warning order to his key personnel. Because the battery commander indicated that movement would be phased to maintain continuous air defense coverage, Brown tells his platoon sergeant to form an RSOP party per battery SOP and to load all mission nonessential AFP equipment on designated trucks. Information is provided on the location of the new position and times the movement will occur, to include when the AFP will be released from its current mission for movement, time to cross the start point (SP), time to clear the release point (RP), and time to be operational at the new position.

PLANNING:

The battery commander and Lieutenant Brown complete their plans by conducting a map reconnaissance of the proposed area for distance and suitability, selecting primary and alternate routes and checkpoints, and completing strip maps. They also check for alternate positions the AFP could use if the designated area proves unsuitable. The assistant platoon leader will continue operations with the battery(-) at present location until the AFP becomes operational at the new site. Brown will lead the RSOP party and, per battery SOP, the executive officer (XO) will march order and move the AFP to its new position. Brown briefs the battery commander on the makeup of his RSOP party to include personnel, vehicles, and equipment (figure 1 below).

RSOP Party Composition

VEHICLES	PERSONNEL	EQUIPMENT
¼-ton truck with trailer	NBC Survey and Decon Team, Platoon Leader, Driver	AN/VRC-47, individual weapons
2½-ton truck	Platoon Sergeant, Driver, 8 Guides/Security/Mine Detection Team	PRC-77, automatic and individual weapons, mine detector, RC-292 antenna, equipment ground stakes, GP small tent

BRIEFING AND ORDERS:

After the battery commander approves the plan, Lieutenant Brown briefs his personnel covering all elements of a five-paragraph field order (situation, mission, execution, service support, and command/signal) and indicates that the RSOP party will depart the present position immediately. Present position will be the SP, and the intersection of two main roads at the new location will be the RP (figure 2). His briefing and issuing of orders include continued operations in the absence of key leaders.

RECONNAISSANCE AND SELECTING POSITIONS:

As soon as RSOP preparations are complete, Lieutenant Brown departs with his RSOP party. He insures that the selected primary route meets equipment (height, weight, width) requirements and is passable, avoids built-up areas (possible ambush locations are minimized), and he positions road guides as required. He keeps the battery(-) posted on his progress by referencing checkpoints. Since the unit does not have secure radio, authentication of transmissions is required.

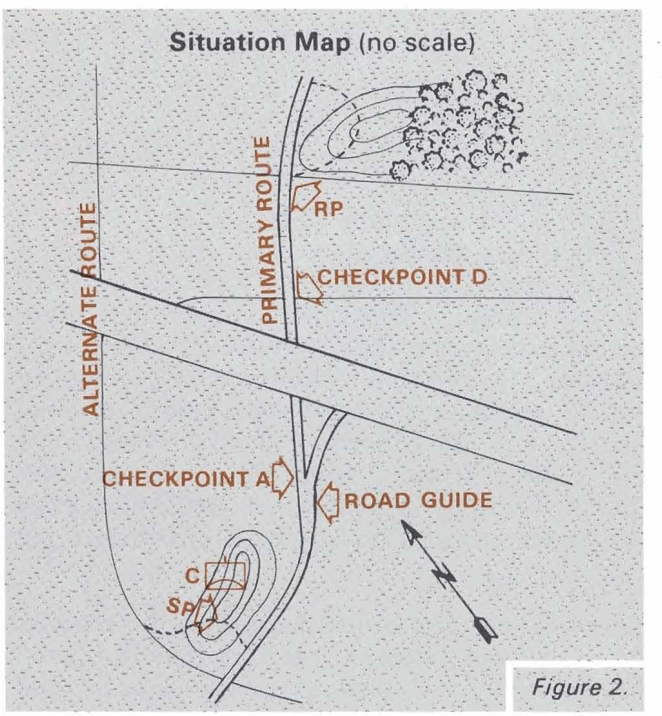


Figure 2.

PLAN AND PREPARE FOR OCCUPATION:

As Lieutenant Brown's RSOP party approaches the new field location, he makes a visual check of the area and determines that this location would allow him immediate occupation of the forward slope. Ground reconnaissance reveals that the terrain provides good natural concealment, has

two access roads into the position (for primary and alternate routes), and has firm, dry ground that will support the weight of platoon equipment. The east side of the area is wooded (providing necessary concealment) and the western portion is relatively open. Hill terrain will provide good radar coverage.

The NBC survey and mine detection teams check the immediate area and find it free of contamination and mines. Lieutenant Brown then directs his platoon sergeant to lead a security sweep with the drivers and equipment guides. When he is satisfied that the area is clear, he puts a local security plan into effect. This includes positioning automatic weapons overlooking the main avenues of approach and alternate route into the position and siting other security positions around the area to preclude gaps in the perimeter. A primary target line and sector of fire are assigned to each individual, and communications are established with all positions.

His platoon sergeant supervises these actions while Brown makes a quick survey of the area to determine where to place his platoon equipment and supporting elements. When security and clearing operations are completed, he notifies the battery commander by radio that the area is ready to be occupied. He then directs his platoon sergeant to select specific locations, with good concealment and dispersion in the wooded area, for the platoon command post (PCP) and support elements while he selects positions for the AFP. He selects dominating, high ground for the continuous wave acquisition radar (CWAR), which needs terrain priority to minimize radar masking.

At the CWAR site, Lieutenant Brown uses the M2 aiming circle to shoot an azimuth to three prominent terrain features that are located at least 305 meters away. These features are known datum points (KDP) used to orient the equipment under day, night, and inclement weather conditions. He then prepares a radar coverage diagram using the hasty method. After completing this diagram, he selects sites for the three launchers (allowing necessary distance for missile back-blast (61 meters)) and for the high-powered illuminator radar, PCP, and three generators. Position requirements for radars (31 meters away from each other to be free from radio frequency interference) and for generators (fans away from the radars so interference will not result) are met. The IFF is mounted on the PCP and equipment dispersal does not exceed maximum cable length of 114 meters. His driver places a corresponding marker at each position to identify equipment locations.

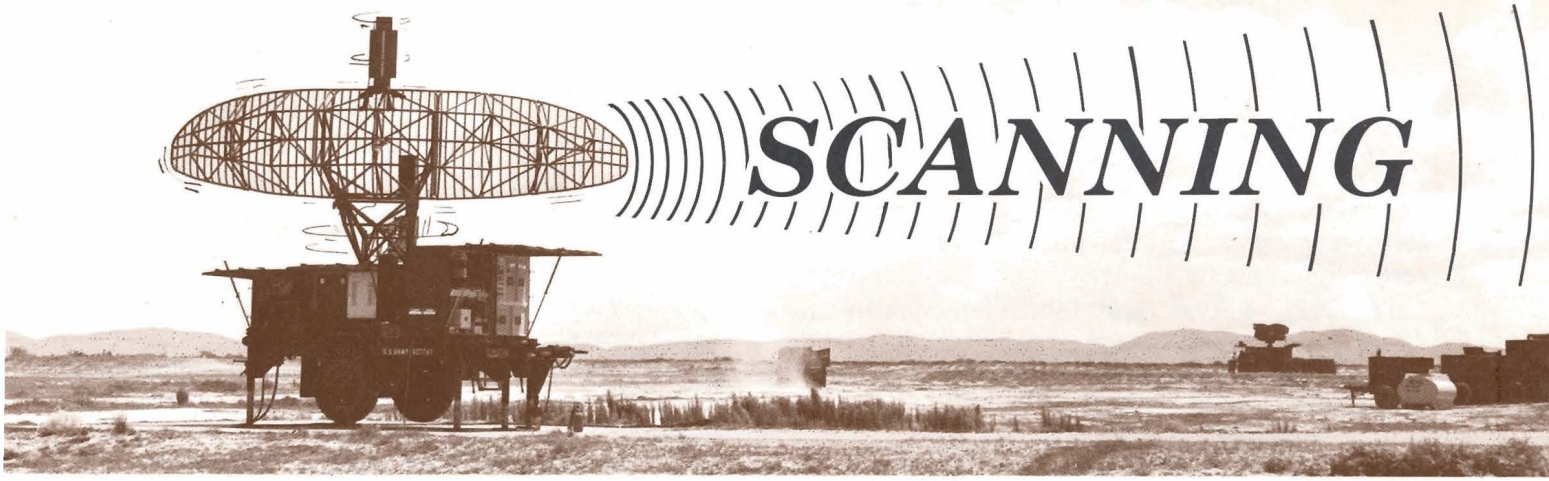
During the selection of specific sites for equipment, the RSOP party receives word from the battery that the AFP has been released from its air defense mission and will cross the SP within 5 minutes. The platoon sergeant gathers all equipment guides, leaving necessary security, and briefs them on who will escort what equipment, where to meet the vehicles (at the RP), and where the equipment will be escorted. After a rehearsal, the platoon sergeant uses a detail to erect the general purpose (GP) small tent and RC-292 antenna. Lieutenant Brown sets up an operational CP with communications to the battery(-) and perimeter defense elements.

MOVEMENT AND OCCUPATION:

During road movement of the AFP, the XO uses checkpoints to keep Lieutenant Brown appraised of the AFP's progress. As the AFP closes on the RP, escorts position themselves to meet their assigned vehicle/equipment, guide those vehicles to their proper site, and position the equipment. The XO then assumes operation of the CP while Lieutenant Brown alines his equipment, brings it to an operational state, and assumes battle stations. His platoon sergeant supervises improvement of the ground defense posture and camouflage and revetment of equipment.

MAJOR MEIGEL *is serving as Senior Instructor/Author in the How-to-Fight Branch, Tactics Department, US Army Air Defense School. He is a graduate of Gettysburg College and holds a Master of Arts Degree in Management and Supervision from Central Michigan University.*

CAPTAIN D'ANDREA *is currently enrolled in the ADA Officer Advanced Course at Fort Bliss, Texas, and will be assigned to Fort Lewis, Washington, upon graduation. He is a graduate of Duquesne University with a Bachelor's Degree in Foreign Languages.*



PATRIOT PRODUCTION

The Army has awarded approximately $123.1 million to Raytheon Company for Fiscal Year 1980 production of Patriot, the Army's newest and most advanced air defense missile system.

Defense Department approval for limited production of Patriot was announced in September. DOD said that full-scale production will depend on test results with the first production hardware and other tests planned during the next 2 years.

The computer-assisted Patriot is so sophisticated it can diagnose its own problems and tell how to solve them. Featuring a new guidance scheme, along with the digital computer, Patriot can simultaneously destroy a number of planes over a wide range of altitudes, maneuvers, and countermeasures, and operate under all weather conditions. It is expected that the highly mobile Patriot will replace both the Nike Hercules and Hawk weapon systems.

JAPANESE MISSILEMEN AT BLISS

Between August and November 1980 more than 1,600 Japanese Army and Air Force personnel completed their annual service practice (ASP) firing Basic Hawk or Nike Hercules missiles on Fort Bliss ranges.

The Japanese Army units have been firing their ASP at Fort Bliss since 1964. The Japanese Air Force has conducted its annual firings at Fort Bliss since 1962.

Prior to their long trip from Japan to Fort Bliss, Texas, the missilemen undergo intensive training in preparation for their ASP. According to Japanese officials, only the best trained of their missile personnel make the trip. To be chosen for the ASP firing is considered a great honor by the highly competitive personnel. The men coming to Fort Bliss for their ASP represent 19 units. A rotation system is used and following their 2 weeks of firing they return to their parent organizations in Japan. Each contingent consists of about 39 crewmembers.

Each year the Japanese Army personnel transport their Basic Hawk systems to Fort Bliss from Japan at considerable expense. Japan does not have the necessary land area required for safely firing the Basic Hawk missiles.

According to Japanese officials, annual ASPs cost the Japanese government in excess of $10 million. The training obtained is considered by the Japanese Government to be well worth the costs.

Japanese soldier checks out Hawk system prior to firing.

US NATO BASE

NATO opened its first "base" in the United States for a Nike (Missile) Training Center at Fort Bliss, Texas, in September 1980.

The facility, which occupies 8 buildings on Fort Bliss, will train 265 students a year — all soldiers

from the NATO nations of Belgium, Germany, Italy, Greece, The Netherlands, and Turkey.

Fort Bliss is the site of the US Army Air Defense School as well as the German Air Force Air Defense School.

The opening of the NATO Nike Training Center is the first time a "major foreign logistics installation has been established in the United States," said General Ehlge Omreng of the NATO Maintenance and Supply Agency.

In 1975 the US Army announced it would gradually phase out the Nike Hercules high-altitude defense missile system, ultimately replacing it with the Patriot.

At that time NATO nations began a reexamination of the Nike systems originally designed and fielded during the late 1950s. In 1977 the NATO member countries using the Nike system decided to redesign the system with new state-of-the-art components to assure supportability of the system into the 1990s. That new support system is now in the process of being implemented.

In 1978 the US announced it would not participate in this program and would be unable to train European Nike technicians in the maintenance of the modernized European system configuration. Thus NATO began plans to provide training on its own.

In November 1978 the NATO Maintenance and Supply Agency developed a proposal for establishing the training center at Fort Bliss.

Students at Fort Bliss' NATO facility will take 10 different kinds of courses covering all aspects of the modified Nike Hercules system and its peripheral equipment. All courses will be taught in English. Four will be translated into German. Courses will range from 6 to 70 weeks in duration. Classes began in October 1980.

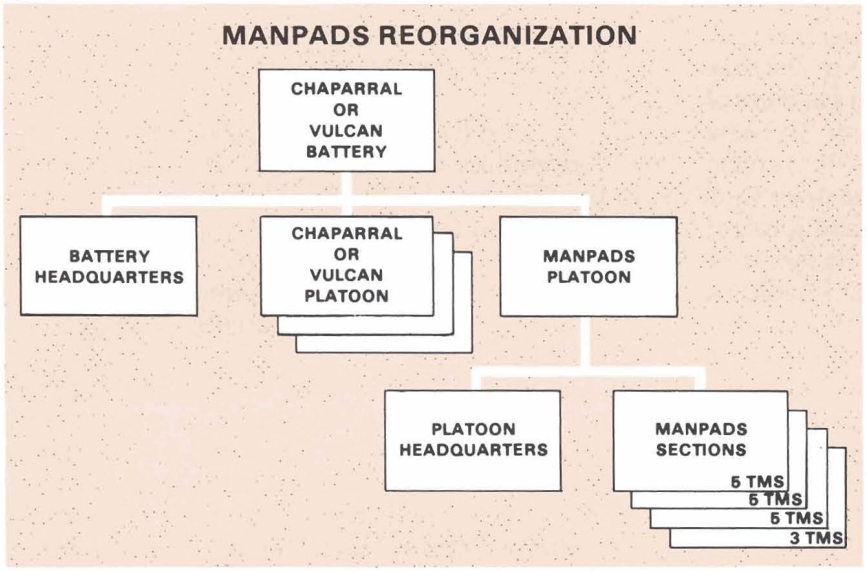
NATO has allocated $9 million annually for the operation and administration of the school. From 1978-1981 the participating countries will have invested over $40 million in the training program. The facility is directly linked to the NATO Supply Center in Luxembourg.

MANPADS REORGANIZATION

In February 1980 the Army Chief of Staff directed that a review be conducted of the operational and training benefits associated with the consolidation of Redeye and Stinger under the divisional air defense battalion and under the headquarters and headquarters company (HHC) of separate brigades/regiments. Based on that review, on 28 August 1980, General Meyer approved a consolidation plan for all Redeye and Stinger assets.

The reorganization plan calls for the creation of a MANPADS platoon in each division's C/V battalion line battery and a separate platoon in the HHC of separate brigades/regiments. The necessary tables of organization and equipment to implement the decision are being prepared and will be released to the major commands upon TRADOC approval. The actual date of reorganization within each division and separate brigade/regiment will vary due to local requirements, such as equipment, billets, and mission.

The MANPADS platoon assigned to the C/V battalion will consist of a platoon headquarters (platoon leader 0-2, platoon sergeant E-7, and a radiotelephone operator (RTO)) and four sections. The sections will have a section headquarters (section sergeant E-6 and RTO) and three of the four sections will have five MANPADS teams, with the fourth section having only three teams.



ENLISTED CAREER NEWS

NEW MAIL SERVICE

Now you can expect to get your military mail faster. The Army has been charged with handling postal operations for all the Services under one joint activity. Before, each Service ran its own postal operation.

The new Military Postal Service Agency (MPSA) will end unnecessary duplication and delay caused by the separate Service operations. It will also improve the overseas mail service, officials say.

ARMY-WIDE FIRST SERGEANTS COURSE AT FORT BLISS

The Chief of Staff, US Army, has approved a TRADOC proposal to institute an Army-wide First Sergeants Course at Fort Bliss, Texas. The Course is currently being developed by the Directorate of Training Developments, US Army Air Defense School, and will be conducted under the auspices of the US Army Sergeants Major Academy. The new course will be open to all branches and MOS and is directed toward E-7s and E-8s, without prior first sergeant experience, who are programed for first sergeant assignments. Until permanent facilities can be constructed, the course will accommodate a reduced student load of 60 per class with 5 classes per year, using existing facilities on Fort Bliss. The pilot First Sergeants Course is scheduled to begin October 1981. It is anticipated that a new facility capable of supporting the full projected student load of 180 per class will become available in FY 86.

APPRENTICESHIP PROGRAM

The Army has a program that is designed to prove to civilian employers that a soldier has gained a valuable skill while in the service. Soldiers in 134 MOSs can become apprentices in 74 civilian trades while they are on active duty. But only about 15,000 of the 100,000 soldiers who are eligible for the apprenticeship program are taking advantage of it.

When these soldiers complete the program, whether while they are in the service or after they get out, they will not only have work experience behind them, they will also have a certificate from the US Department of Labor to show to potential employers.

All a soldier has to do is check with his local education center to see if his MOS is part of the program.

ARTICLE 15 CHANGES

Commanders will find the most recent changes in the Military Justice Regulation to their liking. According to DA Judge Advocate General (JAG) officials, an interim change to AR 27-10 lessens the administrative burden on commanders giving Article 15 punishment. The change was put into effect 20 May 1980.

JAG officials state that commanders giving minor Article 15 punishment now must decide whether the Article 15 form will be filed in a soldier's military personnel records jacket (MPRJ) or his official military personnel file (OMPF). Previously, "minor punishment" Article 15s had

to be reviewed at the special or general court-martial level to determine filing status.

The change also provides that the commander's decision is final in the filing status of "minor punishment" Article 15s.

Minor punishment, officials say, is defined as restriction for 14 days or less, extra duty for 14 days or less, detention or forfeiture of pay for not more than 1 month, correctional custody for 7 days or less, warnings or reprimands.

In addition, officials say the regulation change ends the mental status exam for soldiers before trial by court-martial. This applies to general and special courts-martial which have the authority to rule on a bad conduct discharge.

The change further provides for notifying local finance and accounting officers early when Article 15 punishment affecting pay is being appealed, officials said.

RECORDS ARE FREE

Some things in life are still free — and a copy of your Official Military Personnel File (OMPF) is one of them.

However, officials at the Enlisted Records and Evaluation Center in Fort Benjamin Harrison, Indiana, say soldiers often send a check or money order when requesting a copy of their OMPF.

When the original records were converted from paper file to microfiche about 2 years ago, the Center issued a statement that an OMPF fee would be charged. However, this message was quickly rescinded and no fee was ever imposed.

If you want a copy of your OMPF, you only need to write your social security number and your signature on a standard sheet of paper. Mail it to: Commander, US Army Enlisted Records and Evaluation Center, ATTN: PCRE-RF-I, Fort Benjamin Harrison, Indiana 46249.

SHORTER OVERSEA TOURS

Some junior soldiers will serve shorter tours in Europe or Japan effective 1 October 1980. First termers on a 3-year enlistment who are not command sponsored will have to stay only 18 months. Soldiers now serve 24 to 32 months in these areas.

This change allows junior soldiers to serve part of their first enlistment overseas and part at a stateside post. It also shortens tours for those first termers who are already overseas. Under an adjustment plan, these soldiers won't have to serve there involuntarily beyond 30 March 1982.

Soldiers in a 4-year enlistment and those who take their dependents overseas at the Army's expense will serve the present tour length.

An Army review board recommended the 18-month unaccompanied tour early in 1979. Army officials feel the reduced tour will improve morale among single and unaccompanied soldiers serving long tours away from the states.

CASH ENLISTMENT BONUSES

New soldiers and those with 4 or fewer years of prior service who were out of the Army for more than 90 days are now eligible for cash enlistment bonuses, if they enlist in certain MOSs.

To be eligible for a cash bonus, soldiers in these categories must be high school diploma graduates, must be in mental categories I-III, must enlist for 4 or more years, and must not have previously received an enlistment or reenlistment bonus.

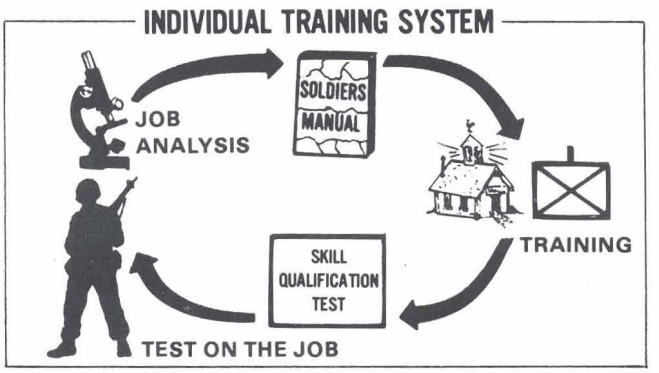
Bonuses are now offered for enlisting in one of the following MOS: 05B, 05C, 05D, 05G, 05K, 05H, 11B, 11C, 11H, 12B, 12E, 12F, 13B, 13E, 13F, 15E, 15J, 16D, 16E, 19D, 43E, 54E, 82B, 82D, 96C, and 98G.

Added to the enlistment bonus program was MOS 16C Hercules Fire Control Center Repair Manager.

NEW DIRECTIONS

SQT

A review of the SQT program in 1980 revealed some problems but confirmed that the concept is sound and should be continued. But the review also revealed that the program required some modifications. The September 1980 issue of the *US Army Training Support Center Bulletin* contains a comprehensive report on the new directions for SQT.



BARS to STARS

OPMD UPDATE

OFFICER EDUCATION CHANGES ANNOUNCED

A new system to select officers to attend Command and Staff College (CSC) level training and the establishment of the Combined Arms and Services Staff School (CAS^3) program have been approved by the Army Chief of Staff.

Command and Staff College

Starting with academic year 1982-83, a year-group selection method will be used to select officers to attend CSC, with officers competing in their own year groups for selection. A 2- to 3-year transition period will be required to implement the new selection plan.

Officers will be eligible for selection to attend CSC between their 8th and 11th years of commissioned service.

Each of the 4-year groups in the zone of eligibility (8-11 years of service) will be allocated a percentage of the seats for each CSC class. The allocations are: 15 percent to the year group in the 8th year of service, 15 percent for the 9th year of service, and 35 percent for each of the 10th and 11th years of service.

During the transition period for CSC selection, the current 8-15 years of service selection eligibility criteria will be retained until 1983. Selection of officers with 12-15 years of service, between 1982 and 1983, will be based on how many officers in the 12-15 year group have already attended CSC. Year-group competition for officers with 8-11 years of service begins in 1982.

Transition to the new CSC selection system should be completed in 1985.

Combined Arms and Services Staff School

The mission of the Combined Arms and Services Staff School (CAS^3) is to provide active duty and Reserve Component officers the instruction necessary to serve as staff officers with the Army in the field. Three major functions of CAS^3 are to teach what staffs are by defining and tracing the development of staffs and staff roles; teach what staffs do by presenting instruction on common and collective staff procedures and skills; and teach how staffs operate. Student officers will apply acquired skills and knowledge in a variety of simulated staff situations.

The CAS^3 program will include both resident and nonresident phases. After completing the nonresident instruction, officers will attend the resident TDY CAS^3 course during their 7th, 8th, or 9th year of service. All officers must participate, and those who complete the nonresident instruction (NRI) package will attend CAS^3. The scope of the package will be validated as part of the first three CAS^3 resident classes. The length of the resident CAS^3 instruction is under consideration by TRADOC.

The CAS^3 program will begin in phases with the first course at Fort Leavenworth during FY 1981. When fully implemented, in FY 1985, approximately 3,300 active duty OPMD-managed officers and a yet to be determined number of Reserve Component and non-OPMD-managed officers will attend CAS^3. TRADOC is analyzing the feasibility of conducting resident CAS^3 courses also at other locations. Graduates of CAS^3 may be selected to attend either the Command and Staff College or a senior service college, or both.

Other elements of the officer education system being studied include expansion of officer basic courses, development of military qualification standards, functional courses associated with officer specialties in lieu of officer advanced courses, and precommand courses.

With the announcement of these officer education changes, certain pertinent questions as to implementation have already surfaced.

Actions planned during the transition period for CSC selection include:

Academic Year 81-82.

1. Begin to put 3-year assignment stability criteria into effect.

2. The current CSC selection eligibility criteria (8 to 15 years of service) will be retained.

3. No year group competition for CSC selection.

Academic Year 82-83.

1. Finalize implementation of DOD-required, 3-year assignment stability criteria.

2. Begin year-group competition (8 to 11 years of service) for CSC selection.

3. Selection eligibility for CSC remains 8 to 15 years of service. Selection of officers having 12 to 15 years of service will be based on how many officers in these years-of-service groups have already attended CSC.

Academic Year 83-84.

1. Meet DOD-required, 3-year assignment stability criteria for all officers.

2. CSC selection — year group competition for officers having 8 to 11 years of service.

3. Complete CSC selection for officers having 12 to 15 years of service.

Academic Year 84-85.

Complete implementation of the new CSC selection system (8 to 11 years of service by year group in accordance with the 15, 15, 35, and 35 percentages of available class seats).

THE NEW OERS

Increasing the role of senior officers in the evaluation process is one of the major objectives of the new officer evaluation reporting system (OERS).

The new system focuses attention on senior raters and charges them with the difficult duty of balancing their obligations to the rated officer with their obligations to the Army. Senior raters must prepare fair and honest evaluations which give each rated officer credit for his achievements and potential. At the same time, they must provide sufficiently realistic and discriminating evaluations to allow Department of the Army career managers and selection boards to make intelligent personnel management decisions.

Overall, senior raters appear to be accepting this added responsibility. There are, however, a few raters who are claiming that all of their officers are in the top 1, 2, or 3 percent of the Army. A senior rater runs the risk of losing credibility with selection boards with this type of inflated profile. In this regard, all officers, especially senior raters, should review the briefing given to selection boards on the new OER. Copies of this briefing were sent to MACOM commanders last April.

Another method the Army uses to emphasize the importance of the senior rater's responsibilities is the publication of the Senior Rater Profile Report (DA Form 67-8-2). Beginning this month, this report will be published annually and will show the rating history of each Army officer who has senior-rated at least five different officers. A copy of this report will be sent to the senior rater and another copy will be placed in the performance section of his Official Military Personnel File (OMPF) alongside all of the senior rater's other performance documents. This is being done to highlight the fact that the evaluation of subordinates is one of the most important responsibilities of senior officers because of its impact on the selection of the future Army leaders. Therefore, the extent to which a senior rater fulfills this responsibility is in itself an indication of his or her performance.

USAR NOTES

Participation in the USAR

Reserve officers have a variety of training opportunities available to them, including:

- Troop Program Unit (TPU) Membership.
- Assignments as Mobilization Designees (MOBDES).
- Active-Duty-for-Training (Individual Ready Reservists).
- Service School Attendance.

The TPU is the mainstay of the Reserve Component Program and, as such, receives priority in the allocation of personnel.

Extensive troop unit experience is a career development goal for every Reservist.

The MOBDES Program is equally important in terms of mobilization readiness, since it affords experienced officers the opportunity to train annually with the active organization they will serve with in the event of a national emergency. MOBDES officers generally serve 2 weeks of active duty with their agency each year and in many cases earn retirement credit during the year by working on assigned projects at home.

Similarly, other Individual Ready Reservists are afforded the opportunity to train with Active Army units each year and to serve in a variety of other active-duty-for-training assignments.

Reserve officers may complete career development service schools (the Advanced Course and Command and General Staff College) either in residence, through a USAR School, or by correspondence work. Additionally, officers accepted for the Logistics, Research and Development, and Foreign Area Officers Specialty programs may attend service schools appropriate to their specialty.

Officers who wish to inquire about these programs and their individual career progression should contact their Air Defense Artillery Branch, Personnel Management Officer (PMO).

The Federal Emergency Management Agency

Created by Executive Order in July 1979, the Federal Emergency Management Agency (FEMA) is responsible for coordinating the disaster preparedness activities of a number of federal, state, and local agencies. As part of its ongoing effort to support the FEMA Program, the Department of the Army is assigning approximately 800 Mobilization Designees (nonunit Reserve officers) to serve with state and local Civil Preparedness Offices.

Since participating officers must perform a minimum of 24 inactive duty training (IDT) periods annually (for retirement point credit), it is imperative that they reside within reasonable commuting distance of their duty station. Normally, recruitment for vacant positions is initiated at the local level, and requests for by-name fills are forwarded to the Reserve Component Personnel and Administrative Center (RCPAC) for final screening by the PMO. In addition to 24 IDT periods, participants will also be afforded the opportunity to serve 12 days each year with their agency in an active duty for training (ADT) status. Assignments to Civil Preparedness Offices will normally be for 4 years.

Officers Must Report Changes

USAR officers are required to report changes of status. Change in status includes address, marital status, number of dependents, and civilian employment. Changes in physical or mental conditions that could keep individuals from meeting standards must also be reported.

Selected Reserve unit members — contact your unit administrative section clerk.

Pretrained Individual Ready Reservists (includes all officers not in selected Reserve unit(s)) notify in writing: Commander, RCPAC, ATTN: AGUZ-RMR-D, 9700 Page Boulevard, St. Louis, Missouri 63132 (for changes in physical status, use ATTN: AGUZ-RCH).

Other methods available to all USAR officers: USPS Change of Address Kit — available from any Post Office, DA Form 3725 — Army Reserve Status and Address Verification (mailed annually to each TPU member, semiannually to IRR members), call or write your personnel management officer, ATTN: AGUZ-OEC.

ADDENDA TO OERs

Since the implementation of the new officer evaluation report (OER) system, a number of questions have arisen concerning OER addenda policy. Paragraph 5-36, AR 623-105, Officer Evaluation Reporting System, lists those inclosures which are authorized for attachment to DA 67-8 OERs. These are the only attachments that are to be accepted for filing in the Official Military Personnel File (OMPF).

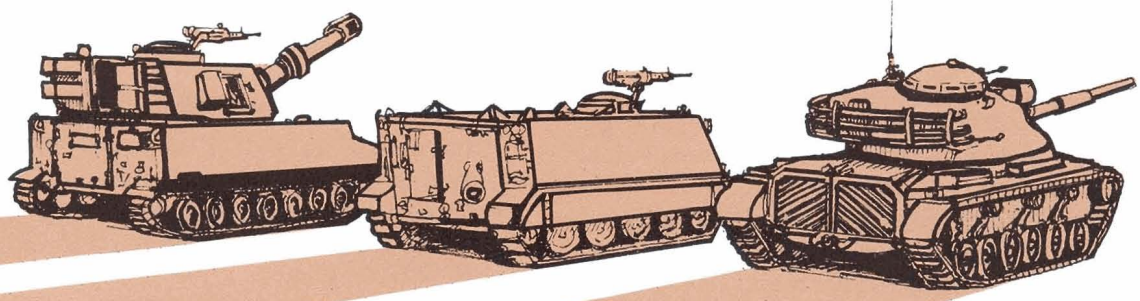
The only commanders' statements that are authorized for attachment to DA Form 67-8 are those that result from a commander's investigation of allegations that wrongdoing had occurred in the preparation of the OER. Even those statements are not automatically included in the OMPF, but rather are disposed of as deemed appropriate on a case-by-case basis.

Finally, AR 623-105 requires that supplementary reviewers be designated in certain circumstances and that these reviewers add inclosures to OERs. The intent of these inclosures is clearly stated in the AR. They are not to be used to add unnecessary remarks to the OER reviewer statements or merely amplify, paraphrase, or indorse the comments of the other members of the rating chain. This is in violation of the intent of the regulation and therefore will not be accepted for filing.

USMA ASSOCIATE PROFESSORS SOUGHT

The Superintendent of the US Military Academy has appointed a committee to screen applicants and recommend the appointment of two Permanent Associate Professors in the Department of Social Sciences. One position is in the field of economics and the other in political science. Applicants must possess at least a master's degree in the appropriate field and must have taught in that field at the undergraduate college level. Those applicants who do not have a doctorate must have the demonstrated academic ability and desire to obtain this degree. Applicants should have a strong military background and potential for attending a senior service school. Any individual interested in applying for either position should request application information from LTC Votaw, Office of the Dean, USMA, West Point, NY 10996.

COMBINED ARMS CORNER



MISSILE COMMAND REORGANIZES

What was formerly the Advanced Systems Concepts Office at Redstone's Army Missile Command (MICOM) recently became the Future Weapon Systems Directorate (FWSD), a team of more than 30 researchers and engineers.

According to Dr. Samuel Hardy, Deputy Director, FWSD, "We're focusing the people, talent, and resources available to the Army — not only at Redstone but elsewhere as well — to satisfy the Army's current and long-range missile and rocket requirements. We must give the soldier what he needs to fight outnumbered and win."

A current major thrust of the Army is the analysis of weapon system needs by mission area. FWSD is the responsible office at MICOM for mission area analysis and as such has already been working with soldiers at the schools and centers to find out what they need and to tell them what is available.

Future weapon systems will receive long-range threat projections from MICOM's Foreign Intelligence Office and technology status and technology thrust from the missile laboratory. These data are then shared with the Army Training and Doctrine Command in defining their deficiencies and requirements.

MICOM, in turn, must take available technology from all sources and focus it toward a solution for the soldier's requirement, whether developing a new weapon system or improving an old one.

Under its new structure, FWSD consists of Experimental Systems and Future Systems. Future Systems, consisting of Fire Support, Air Defense, and Close Combat Teams, will work closely with and coordinate activities between soldiers and MICOM's technology base.

As technology matures, Experimental Systems will be transitioned and will manage the technology to demonstrate the feasibility and potential of a weapon system.

The reorganization will assist in accomplishing the MICOM mission by providing a clearly defined interface with the user, a focus for technology programs, and formulation of long-range plans.

MULTIYEAR CONTRACT MARKS MILESTONE

The Air Force Systems Command has awarded its first major multiyear contract to Aerojet Ordnance Company and Defense Systems Division, Honeywell Inc., for production of 30-mm ammunition. When compared to single-year contracting, this multiyear contract yields a savings of $34 million.

Representing a major milestone in Government contracting, the multiyear approach offers cost benefits and maximizes the use of tax dollars. By spreading investment and manufacturing costs over a longer period, the contractor can offer lower unit prices. Furthermore, with an assured production run, there is more incentive for industry to compete for Government business.

— *Defense Management*
3d Qtr 80

CADETS OFFERED 1-YEAR RESPITE

The US Air Force Academy is trying a novel approach in an attempt to reduce high attrition rates among its cadets. Under a new program, cadets who have completed their sophomore year will be allowed to take off 1 year to "reflect on their individual career goals." To date approximately 10 percent of the 1,025 sophomore cadets have already applied for the program.

— *Defense Management*
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PERSHING FIRINGS

The 400th Army Pershing missile to be fired since the first round was launched 20 years ago roared into the skies over McGregor Range launch complex on 15 October 1980.

The missile's inert reentry vehicle landed on its target minutes later in the northern portion of White Sands Missile Range, New Mexico, some 100 miles away.

German Air Force troops conducted the firing as part of an eight-round series of test and training launches of the powerful NATO missile system.

Units of the Federal Republic of Germany had also fired another round earlier in the day, plus two more earlier in the month. US Army troops from Europe and Fort Sill, Oklahoma, launched the remaining four rounds during October 1980.

A number of Pershing operational test firings are conducted each year under combat conditions to determine the proficiency of troops and insure the quality of missiles assigned to the NATO defense role. In addition, artillery and ordnance firings are conducted for training and to check out new concepts, modifications, or procedures.

The first Pershing missile was launched 25 February 1960, from Cape Canaveral, Florida, beginning a string of six successful firings in the maiden test series. Since then, Pershing's record qualifies it as one of the more successful weapon systems to be developed by the US.

ENGINEERS RETIRE ESSAYONS

The Army Engineers' hopper dredge ESSAYONS, which helped clear the Suez Canal of damage suffered in the 1956 war, has been retired. The vessel, the flagship of the US Army Corps of Engineers dredge fleet, took part in many epochal engineering events in both continental US and foreign waters. Its name is the motto of the Corps, which translated from the French, means "Let us try." Commissioned 16 January 1950, after being completed at the Sun Shipyards in Chester, Pennsylvania, it was the largest in the Corps fleet, with a length of 525 feet. Its capacity was 8,270 cubic yards and its speed while loaded was 12 statute miles per hour. The place at the head of the Corps dredge fleet vacated by the ESSAYONS will be filled by a modern, large class hopper dredge under construction in New Orleans. Chief of Engineers, Lieutenant General John W. Morris, said the ESSAYONS was retired because the dredging industry has demonstrated an ability to take over more of the workload which previously has been accomplished with the Corps of Engineers equipment. The Corps is phasing out the older dredges in the Corps fleet as industry's dredging capability increases.

FIREFINDER RADAR SYSTEM

The new Field Artillery Firefinder Radar System is to be fielded in the Spring of 1981, and qualified radar mechanics are needed to work on this new technology equipment. Personnel with MOS 26B20, Weapons Support Radar Repairer, can earn the additional skill identifier, K1, by completing a new 23-week Firefinder Radar Repairer Course (104-ASIK1) at the US Army Field Artillery School, Fort Sill, Oklahoma.

FY 81 courses are dedicated to produce radar mechanics in support of worldwide fielding of these radar systems. To qualify for this training, a soldier must have MOS 26B20 and 19 months or more time remaining on active duty at course completion. One 26B20K1 will be assigned to each direct support maintenance shop to supervise and perform the maintenance required on Field Artillery Firefinder Radar Systems (AN/TPQ-36 and AN/TPQ-37).

Additional course information can be obtained from Commandant, US Army Field Artillery School, ATTN: ATSF-CT-TM-PD, Fort Sill, Oklahoma 73503. Phone numbers are AUTOVON, 639-4420/3181; Commercial, Area Code, 405, 351-4420/3181.

Applications for attendance should be submitted through appropriate channels (US Army Military Personnel Center) in accordance with AR 614-200.

MISSING DRILLS

Enlisted National Guardsmen and Reservists will no longer be ordered to active duty for repeatedly missing drills. Enlisted Reserve component soldiers who have nine or more unexcused absences from drills in a 12-month period will be considered by administrative separation boards for transfer to the Individual Ready Reserve (IRR) or for discharge under "other than honorable" conditions.

Before this March 1980 policy change, these members could be ordered to active duty or active duty for training to complete their 6-year obligations.

This policy will not affect Reserve soldiers currently on orders for active duty or active duty for training.

NEW MEXICO ARMY NATIONAL GUARD 16F PROGRAM

More than 350 New Mexico Army National Guard recruits participated in a basic training program in 1980 at Fort Bliss, Texas. The program will ultimately qualify each trainee in his military occupational specialty (MOS).

The soldiers, most of them high school juniors and seniors from various cities in New Mexico, were involved in a rigorous combat training schedule which included 7 weeks of basic and 5 weeks of advanced individual training (AIT). The total program was designed to develop leadership in the individual, as well as to give him the military background he will need to function successfully in his MOS when he returns to his home unit at the completion of his active Army training.

The training program is known as 16-Foxtrot. Enlistment in the 16F Program has practically doubled each summer since its beginning. According to National Guard officials, at the rate high school juniors and seniors are enlisting in the program, all New Mexico Army National Guard units will soon be near full strength.

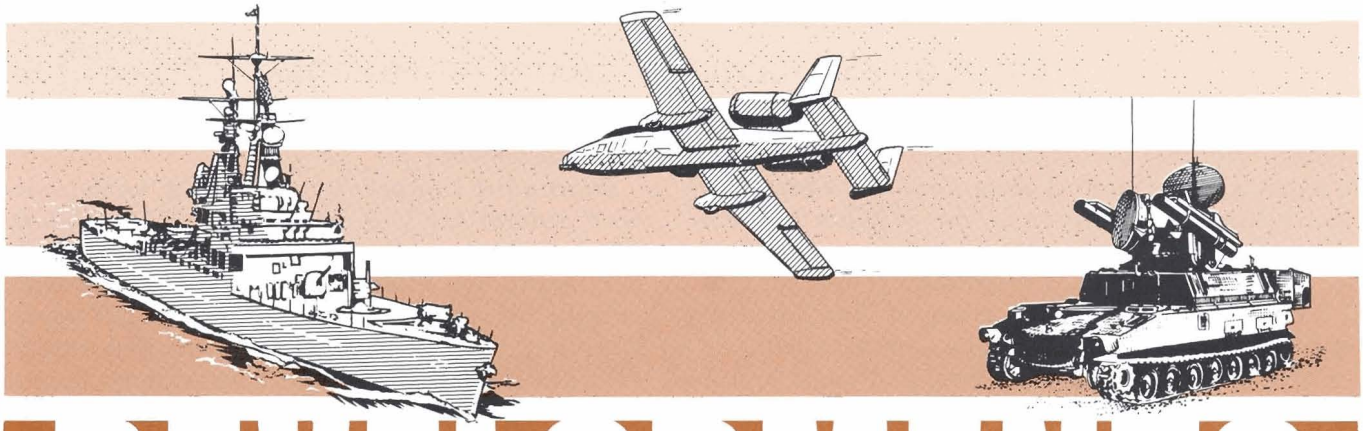
The 16-Foxtrot project allows students, juniors and seniors, as well as seasonal workers, to enlist in the local National Guard unit, begin their basic training early in the summer, and complete AIT before school begins in the fall. This allows the high school senior or the graduate to resume his education, while remaining a member of the National Guard.

During the 13 weeks of active duty, each of the New Mexico soldiers earned up to $1,500.00. In addition, each soldier will receive at least $50.00 per month for attending drill 1 weekend each month, his obligation for a period of 6 years. During this time, each soldier will also attend active training for a period of 2 weeks at some time during the year with his local unit. Promotions come to the individual member as he gains experience and shows leadership and potential. An excellent insurance program, along with other various benefits, is also available.

The program took place in the Fourth Training Battalion in the Logan Heights area of Fort Bliss. It was reviewed by Major Case Gonzales, the Adjutant General's representative at the training site to assist in coordinating the program. Major Gonzales said that the New Mexico trainees adapted well, their morale was good, and they performed in an outstanding manner. "Our men are becoming highly qualified soldiers when they graduate from the 16F Program," according to Major Gonzales.

Information regarding the 16F Program can be obtained by contacting the New Mexico Army National Guard Recruiting Office, P.O. Box 4277, Santa Fe, New Mexico 87501.

New Mexico Army National Guard soldiers reacting to a chemical warfare field exercise.



DEVELOPMENTS

NEW AT&T SATELLITES

American Telephone and Telegraph (AT&T) has ordered technical innovations designed into three new communications satellites that will extend their life expectancy to 10 years from the more common 7-year life of earlier models.

The new satellites, whose capacity for simultaneous long-distance phone calls has been increased to 21,600 from 18,000, are designated TELSTAR 3. The first is scheduled for launch in June 1983. The second satellite will be launched in the summer of 1984, and the third is scheduled for a 1985 or 1986 launch. They will replace satellites AT&T now leases from COMSAT General Corporation, a subsidiary of Communications Satellite Corporation.

Greater capacity for fuel used to keep the satellites on-station while they are in orbit, plus improved batteries and solid-state amplifiers, is chiefly responsible for the satellites' extended life and ability to handle more phone calls.

The new satellites will be based on spacecraft models which have also been ordered by TELESAT, Canada; Perumtel, the Indonesian state telecommunications company; Western Union Corporation; and Satellite Business Systems. The Hughes Space and Communications Group currently is under contract to build 15 of the new spacecraft, which will carry communications payloads designed for various uses.

The $137 million AT&T contract also calls for a 13-meter antenna for the customer's ground control facility at Hawley, Pennsylvania, where three 30-meter antennas are used for satellite tracking and control.

Pending approval by the Federal Communications Commission, AT&T plans to use the satellites and ground facilities as part of the domestic long-distance communications system it operates with GTE Satellite Corporation, a subsidiary of General Telephone and Electronics Corporation. In addition to long-distance telephone service, the system will provide facsimile and video communications services. The system will be capable of serving all 50 states, Puerto Rico, and the US Virgin Islands.

The HS 376, employing the spin stabilization concept pioneered 20 years ago, utilizes a deployable cylindrical panel covered with improved solar cells, and a folding antenna system.

In their stowed configuration, the satellites can be launched from a conventional rocket or from the Space Shuttle. The compact design permits the spacecraft to be carried upright in the Shuttle cargo bay, which minimizes launch costs by reducing the linear space occupied by the spacecraft. The outer solar panel and the antenna are deployed in space.

The spacecraft are approximately 7 ft (216 cm) in diameter. They are approximately 9 ft (282 cm) in height in their stowed position. With solar panels and antennas deployed in space, the spacecraft are nearly 22 ft (660 cm) or nearly two stories in height. The new series was developed in response to customer needs for increased power and versatility while offering a choice between conventional rocket or Shuttle launch.

SMOKE-PENETRATING RADAR

A still largely unexploited form of radar has demonstrated its ability to track targets and guide missiles accurately through smoke and rain as part of a technology experiment program aimed at enhancing the US Army's ability to fight in adverse combat environments.

An experiment was conducted by Hughes Aircraft Company in a joint US Army Missile Laboratory/Defense Advanced Research Projects Agency effort. The radar used operates in the millimeter wave region of the electromagnetic spectrum. This lies between the lower frequency conventional microwave radar and the higher frequency infrared. For purposes of the experiments, a millimeter wave radar unit was used to guide Army tube-launched, optically tracked, wire-guided (TOW) antitank missiles to stationary targets. In three of the successful launches, the target was obscured by heavy smoke and aerosols. For the final shot in the series, the TOW antitank missile was guided to the target even though the smoke-shrouded visibility was further deteriorated by light rain.

All tests were successful in proving that millimeter wave systems have potential for operation through smoke and battlefield aerosols with hit-to-kill accuracy, according to Army officials.

SEES THROUGH SMOKE. Millimeter wave radar was used recently in tests to guide TOW antitank missiles through battlefield smoke and aerosols with pinpoint accuracy in firings at Redstone Arsenal, Alabama. The modified US Army TOW missile launcher, with a 2-foot diameter radar antenna and (behind it) the radar transmitter and receiver, was used in the tests.

Millimeter wave radar is of interest to defense planners because it is superior to conventional radar in angular resolution, and is better than infrared in penetrating adverse weather and other battlefield obscurants such as smoke and dust. Microwave radar and infrared sensing are currently the most commonly used means of tracking targets and guiding missiles in poor visibility conditions.

For the experiments, the basic TOW guidance concept was used, in which the deviation of the missile's position from the sensor's line of sight to the target is measured and commands are sent to the missile over a trailing wire to correct the heading. During the test flights, the millimeter wave radar provided both the target line of sight and the missile's position data to a specially designed radar signal processor. This processor made computations to correct the missile's course to hit the target. These "error-signals" were translated into control commands by a modified TOW missile guidance set.

Further studies are underway to determine what experiments are required to expand millimeter wave technology, including target acquisition, missile capture, and operation against electronic countermeasures and through rain and fog.

Hughes' participation in this millimeter wave missile guidance experiment follows early technology development work in this field for the US Navy and Air Force. As was the case in the two earlier projects, the Army program was directed by the company's Missile Systems Group in Canoga Park, California.

ARMY HOVERCRAFT

The Army has certified and begun production of a hovercraft called the LACV-30 (lighter, air cushion vehicle, 30-ton payload). The purpose of the LACV-30 is to give the Army a quick means of moving cargo from ship to shore and then overland in areas where fixed ports do not exist.

According to Jane's Surface Skimmers, the Soviet Union has a huge lead in naval hovercraft ranging from a 27-ton model designed to carry 24 Marines at 50 knots to a 90-ton craft which can carry tanks. With the production of the LACV-30 by Bell Aerospace, the Army is trying to close the gap.

The Army has already funded for the production of eight LACV-30s, which will be stationed at Fort Story in Virginia Beach. It is proposed that at least four more be budgeted so that the US Armed Forces' first air cushion company can be fully equipped. The Army is looking at the possibility of ultimately purchasing 29 LACV-30s. A larger model that could accommodate the new 60-ton XM1 Abrams tank is also under consideration.

ADVANCED TOW MISSILE

The US Army is conducting a two-step program to improve the performance of the TOW (tube-launched, optically tracked, wire-guided) antitank missile against advanced enemy armor. The first phase of the upgrading program is an improved 5-inch diameter warhead to enhance the missile's armor-penetrating capability. This will be approximately the same size and weight as the current TOW warhead but will be an improved design. The second step, called TOW 2, will include a heavier 6-inch warhead with even greater armor-piercing capabilities. This will occupy the full diameter of the missile body. In addition, the missile guidance system will be improved.

Hughes' Missile Systems Group is the prime system integrator on the improvement efforts. More than 275,000 TOWs have been produced for the Army, the US Marine Corps, and the armed services of 32 foreign countries.

Changes are being planned in such a way as to use to the fullest extent the existing elements in the TOW system. The more potent 5-inch warhead will be able to be fitted on all existing TOW missiles and will not require any changes in the launcher or guidance hardware. The 5-inch warhead improvements will be applicable to all TOW system platforms including helicopters and tracked vehicles.

The TOW 2 modifications feature a microprocessor-based, digital missile guidance set which will provide greater flexibility in guidance programing and higher precision. To compensate for the added weight of the heavier warhead and other missile modifications, the flight motor will be reloaded with an improved propellant to provide a higher impulse. The TOW 2 modifications can be retrofitted into early versions, but will require more sophisticated procedures. Any earlier TOW missile can be fired from the launcher after the modifications for TOW 2 are made.

The Defense Department has requested $105.2 million in FY 81 to purchase 18,000 of the new 5-inch warhead kits to retrofit existing TOWs and $76.6 million for 12,000 new missiles with this improved warhead. In addition, $20.6 million is being sought to continue development work on the TOW 2 changes.

Development and testing on both phases of the improvement program are underway. TOW missiles with the improved 5-inch warhead are expected to be ready for deployment in the early 1980s, while the TOW 2 advances are scheduled to be available later in the decade. Both warhead improvement programs are being directed by the Army's Research and Development Command's Picatinny Arsenal. The overall TOW improvement program is managed by the Army's Missile Command at Redstone Arsenal, Alabama.

NAVY TESTS VERTICAL LAUNCH SYSTEM

White Sands Missile Range (WSMR), New Mexico, was the site of a recent Navy test in which a missile, packaged in a reusable container, was fired from a 22-foot vertical launcher.

The Vertical Launch System is a combined launcher and magazine that can be loaded aboard a ship as a single unit. The purpose of the test was to study the effects of exhaust gases on missiles being fired. Commander W.L. Stanley, a test officer with the Naval Ordnance Missile Test Facility at WSMR, called the launching, "essentially an unqualified success."

The launcher will first be installed on antiair warfare vessels. The module will be inserted in the ships so that the top of the launcher is flush with the deck. Later, the Vertical Launch System will be deployed on virtually any type of Navy vessel and will be capable of firing most missiles now launched from shipboard.

When testing is completed at WSMR, the system will be installed aboard the USS Norton Sound for testing at sea. The Navy expects to deploy the system by 1985 when it will formally be known as the Guided Missile Launcher System (GMLS) Mark 41.

The prime contractor for the Vertical Launch System is Martin Marietta of Orlando, Florida, and the tests are being sponsored by the Navy Sea Systems Command, Washington, DC.

INTELLIGENCEWATCH

SOVIET NUCLEAR-POWERED SURFACE WARSHIP

Aviation Week and Space Technology (20 Oct 80) reports that a new guided-missile cruiser named the Kirov has just been launched. The Kirov is believed to be the first Soviet Navy surface warship propelled by nuclear power. The warship is reported to be in the 25,000-ton class and is one of the largest built worldwide since World War II. Armament on the new ship includes a twin-tube launcher for the SS-N-14 antisubmarine cruise missile. During her maiden voyage, the Kirov will be testing a new, long-range, antiship cruise missile and a new surface-to-air missile.

The Kirov is reported to have the capability of high transit speeds and a good command and control system, which could convert it to a task force flagship. It is expected that a warship of the Kirov size will be well-armed to include helipads, torpedoes, and 100-mm dual purpose guns. Also included in its armament are 8 six-barreled, 30-mm Gatling-type guns capable of firing 5,000 rounds per minute.

Another warship of the 25,000-ton class is reported to be under construction at Leningrad and may be launched sometime in 1984.

SOVIET NAVAL ADDITIONS

According to "Jane's Fighting Ships 1980-81," the Soviet navy is currently undergoing an aggressive ship-building program. The naval buildup, it is reported, calls for the construction of four 75,000-ton aircraft carriers with the possibility that they will be nuclear powered. It has also been reported that the new carriers may be equipped with Su-24 (FENCER) type aircraft.

The Soviets have a massive nuclear-powered submarine fleet that could be expected to penetrate friendly waters in an effort to carry the offensive in any war to the enemy. In combination with their ship-building program and submarine fleet, Russia is fast approaching a status as the world's major sea power.

RUSSIA'S SA-11

The Soviet Army is deploying its new, highly mobile SAM-type missile which it has designated the SA-11. The SA-11 is expected to augment and/or complement the Soviet SA-6, "Gainful," system now in the field and employed at battery level.

The semiactive homing SA-11 missile is said to have a better performance envelope and to be more manageable than the mach 3, SA-6. By placing the SA-11 with the SA-6, the battery gains a greater degree of automation and mobility. Also with the long track (E-band) radar, missile coverage is increased.

— *International Defense Review Vol 13, Jun 80, pg 799*

AK-74 ASSAULT RIFLE

The Soviets have developed a new, small-caliber version of their tried-and-proven AKM to take advantage of modern ammunition technology. Two models are being produced: the standard stock AK-74 and the folding stock AKS-74. The major advantages of the AK-74 over the AKM are that it fires a more lethal round, has a greater effective range, and the ammunition is smaller

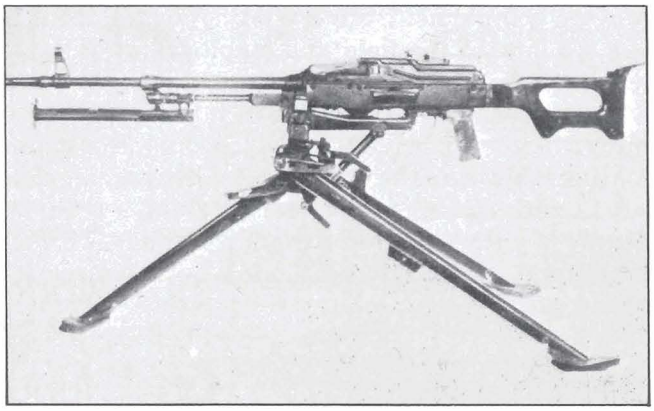
and lighter (which provides a greater magazine capacity and enables a soldier to carry more rounds).

BASIC CHARACTERISTICS

Caliber	5.45-mm
Mode of fire	automatic and semiautomatic (has a selector switch like the AKM)
Max effective range	350 m (382.8 yds)
Cyclic rate of fire	650 rounds/minute (rifle is normally fired in short bursts)
Ammunition	high-velocity ball (somewhat similar to US M16 round)
Magazine capacity	40 rounds
Bayonet	Knife/wirecutter (same as the AKM)
Weight of rifle with loaded magazine	3.5 kg (7.7 lb)

SOVIET INFANTRY/AA GUN

The Russian Army has a large arsenal of infantry weapons among which is the PKM 7.62-mm, which is also used in an antiaircraft role.



AN/PRC-104 FOR SWEDISH ARMY

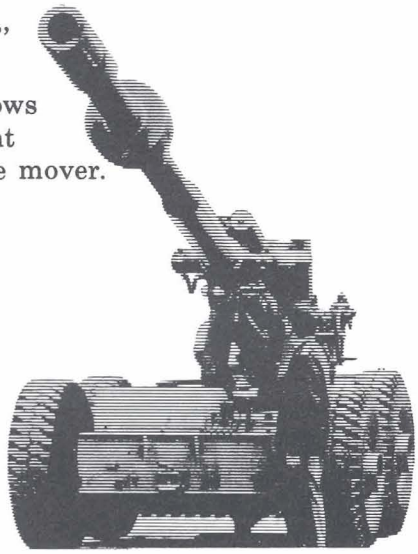
Swedish Army soldiers will be able to communicate dependably with the AN/PRC-104 Manpack portable radio. The Manpack offers a choice of 280,000 frequencies to enhance reliable communications despite inclement weather, rugged terrain, or other conditions that make communications difficult. The radio is all solid-state and virtually automatic. An operator only has to turn on the power, select a frequency, and press a switch to talk. Delivery of 1,400 radios to the Swedish Army will be completed by the end of 1981. The AN/PRC-104 — which operates in arctic, desert, and jungle environments — also is used by the US Marines, Air Force, and Navy, and the New Zealand Army.

NETHERLANDS AIR SQUADRON CITED

The 32d Tactical Fighter Squadron (TFS) of Camp New Amsterdam, Svestuberg, The Netherlands, was presented the Hughes Achievement Award for 1979. The trophy is given annually by the US Air Force to the outstanding squadron assigned a primary mission of air defense. Judging is based on operational performance, readiness capability, and other achievements. The 32d TFS keeps two F-15s with air-to-air armament on a 5-minute alert to intercept unidentified aircraft penetrating the northern borders of West German airspace. It is the first time a squadron equipped with F-15s has won. The F-15 is built by McDonnell Douglas Corporation and carries the Hughes AN/APG-63 radar.

NEW HOWITZER

The Republic of South Africa has recently added a new 155-mm towed howitzer to its arms inventory. The "G-5" shown here is air transportable and replaces the 25-pounder and 5.5-inch guns currently in service. As with other new towed artillery systems the "G-5" has an auxiliary motor which allows limited movement without its prime mover.



Once Greatness

THE SIOUX, LIFE AND CUSTOMS OF A WARRIOR SOCIETY,
by Royal B. Hassrick.
University of Oklahoma Press, Norman, OK, 1980. 380 pages, $15.95.

The Sioux warrior, who to the American public was the archtype Indian from which the public's concept of Indians is drawn, is presented in this easily read book as a man driven by the environment in which he lived. Originating in the Mille Lacs region of what is now Minnesota as a woodland, hunter-gatherer culture, the Sioux tribe was forced westward by tribes of superior strength and is recorded as being west of the Mississippi river in 1680. By 1700 they had become buffalo hunters and began their domination of the Great Plains. The buffalo became their economic base, and to reap the harvest the horse became the essential tool. War became a necessary ingredient to maintain control over the buffalo and to obtain the horses they needed. The survival and well-being of the Sioux nation were dependent upon the bravery and fierceness of its warriors. To this end, individual status was achieved through success in war. "It is better to die on the battlefield than to live to be old," was a maxim of Sioux existence. With war as the basis for personal recognition; the horse as the substance of personal wealth; bravery, fortitude, generosity, and wisdom as the virtues all men were expected to seek, together with the need to band together for mutual cooperation, a complex political and social organization was developed. These factors welded the Sioux into a great nation that totally dominated the western Great Plains until the tribe was defeated by the US Army in the late 1800s.

Hassrick discusses the Sioux culture, traditions, philosophy, political and social organizations, family, and motivations in great detail. One "emerges" from this book with an understanding and appreciation of what the Sioux were and what drove them, and with a sense of loss because of greatness gone.

Milton F. Krone
US Army Air Defense School

INFANTRY WEAPONS OF THE WORLD,
by Christopher F. Foss and T.J. Gander.
Charles Scribner's Sons, New York, 1979. 135 pages, $12.50.

The American 40-mm grenade launcher, British 4.85-mm Individual Weapon, and Soviet AK-47 are a few of the many infantry weapons described in this work. Descriptions of mortars larger than 60-mm, along with other heavy infantry weapons and antitank missiles, are reserved for two companion books, *Artillery of the World* and *Missiles of the World* and, consequently, are not included in the text.

This updated edition includes many new photographs of main infantry weapons around the world and several other weapons under development. Standard, older weapons still in the inventory and being used are also included to make this edition a handy reference source for the military enthusiast and modeler.

THE ENIGMA WAR,
by Jozef Garlinski.
Charles Scribner's Sons, New York, 1980. 219 pages, $14.95.

Using documents of the British Government's Code and Cipher School which have only recently been made public, Jozef Garlinski's *The Enigma War* provides a very readable yet detailed account of the cryptology activities of the German, English, French, Russian, American, and Polish intelligence services prior to and during World War II. The book primarily focuses upon the incredibly successful efforts of deciphering German secret radio transmissions encoded via the device called "Enigma." The operation of the "Enigma" device, the methods used by the Germans to encode messages, and the methods by which English and Polish decipherers were able to break the German codes are extensively outlined. The book also provides numerous examples of how poor communications security and techniques, by both Axis and Allied signal operators, led to the compromise of vital military secrets throughout the war. Garlinski's book also documents how the information obtained through the successful deciphering of German codes contributed immeasurably to Allied successes in the land, air, and naval battles of WW II. He describes several rudimental deciphering machines that were direct forerunners of modern electronic computers; and includes an appendix that provides a brief introduction to mathematical permutation analysis used in cryptology.

Major Stephen F. Likins, USAR

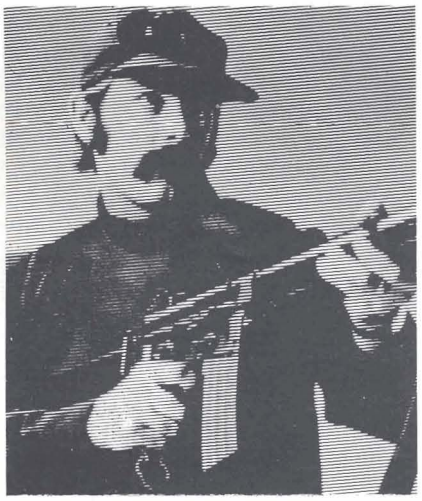
IS Equipment

INTERNAL SECURITY WEAPONS AND EQUIPMENT OF THE WORLD,
by Michael Dewar.
Charles Scribner's Sons, New York, 1979. 127 pages, $12.50.

This book provides illustrated, fact-filled descriptions of current internal security (IS) equipment in use throughout the world. Also included is IS equipment under development.

With the alarming increase in internal dissent, terrorism, and insurrection, many world governments have determined that investing in special purpose IS equipment is both militarily sensible and politically expedient. This equipment is varied and, in some cases, multipurpose. For example, some of the weapons mentioned — armored vehicles, surveillance and communications equipment, and weapon sights — can be considered both IS and military equipment. However, if the equipment was developed for use, or in some way was used, in an IS role it is included in the book.

The book is replete with illustrations and data and serves as a perfect complement to *Police of the World*. Together, this pair of books provides an in-depth view of world law-enforcement agencies and the instruments they use to counter modern-world crimes and terrorism.

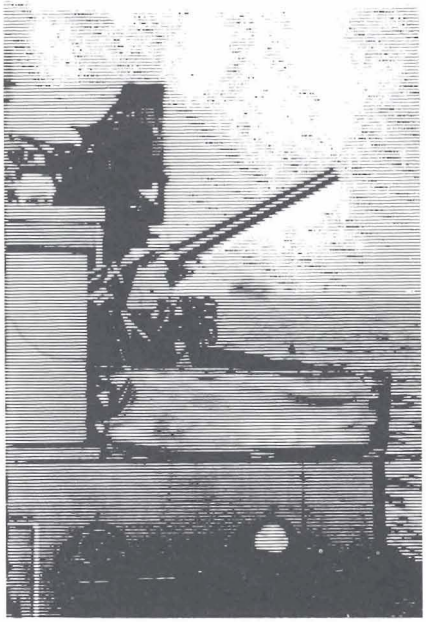


United States Tactical Police Vest.

BATTLESHIP,
by Martin Middlebrook and Patrick Mahoney.
Charles Scribner's Sons, New York, 1979. 302 pages, $12.50.

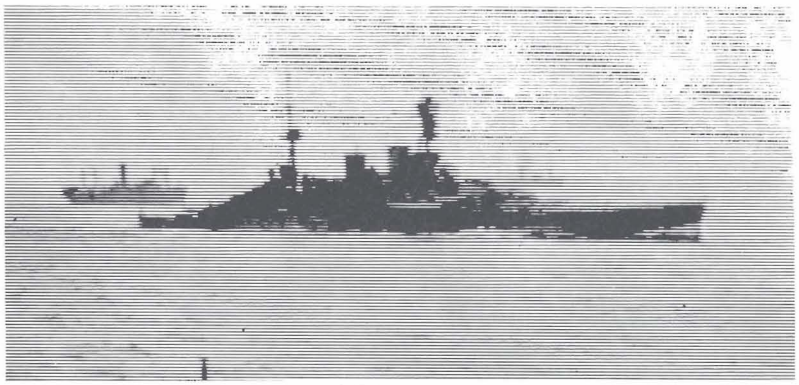
The authors have isolated a dramatic portion of World War II history and magnified it into an enthralling and authoritative story. The story revolves around the British battleship PRINCE OF WALES and the battle cruiser REPULSE and their ill-fated journey to the Far East in 1941. Both ships fell victim to a series of Japanese air strikes on 10 December 1941 and were sunk.

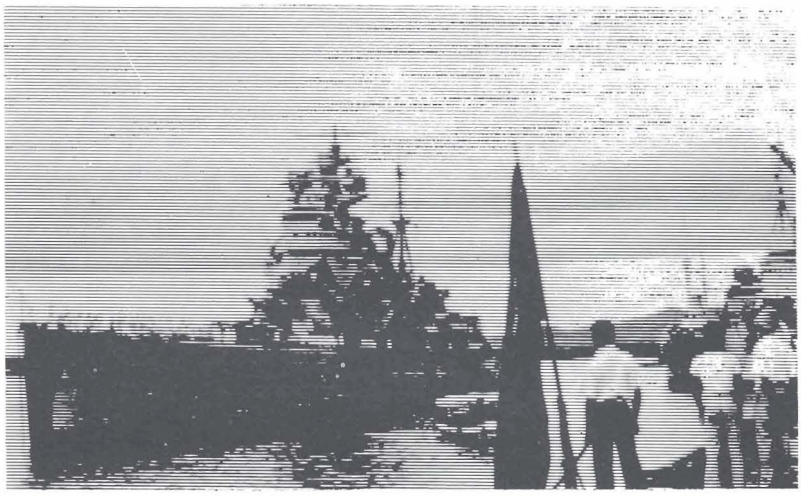
The authors have researched the incident, covering Churchill's controversial decision to dispatch ships to rescue the survivors. British and Japanese official records were scrutinized and 193 naval officers, enlisted men, and personnel connected with the disaster were interviewed. Of interest is the handling of the material to show the Japanese side of the incident.



Above: Repulse's 4-inch antiaircraft gun overshadows convoy.

Below: Repulse escorts convoy, sailing round Cape of Good Hope to Suez.





Prince of Wales reaches Singapore.

Restrained Confrontation

STRATEGIC DEFENSE IN SOVIET STRATEGY,
by Michael J. Deane.
Advanced International Studies Institute, East-West Towers, Suite 1122 West Highway, Washington, DC 20014.

Michael Deane in his treatise *Strategic Defense in Soviet Strategy* reviews recent writings and speeches of Russian military and political leaders.

Deane surmises that the scheme of Soviet nuclear war policy and resulting force structuring are predicated on the following Soviet perception: The United States, with its employment of forces throughout Europe, the Mediterranean basin, and in the Near East and Far East, and with its recent involvement in Southeast Asia, has clearly demonstrated itself to be both imperialistic and aggressive. Avoidance of a nuclear confrontation between the Soviet Union and the United States solely via reliance upon a policy of mutually assured destruction, as is the current United States position, is irrational because:

- It relies upon the adherence to the policy only through the good faith of the enemy.
- Should deterrence fail, each side courts its own total destruction if it has refrained from establishing the necessary war-survival forces.
- History has shown that a "balance of force" policy has never contributed to the preservation of peace but has always in the final analysis led to military conflicts.
- Nuclear weapons themselves insure only that the conflict will be decisive; they do not preclude the possibility of its occurrence.

The Soviet attitude is that because the United States is imperialistic and aggressive, its good faith cannot be used as a basis for the survival of the Soviet system. The Soviets also believe that a military confrontation between two superpowers is unavoidable.

Soviet military doctrine, therefore, holds that since a nuclear war is likely, the Soviet objective must be victory by eliminating the United States as an effective opponent.

To achieve such a victory, a combination of Soviet military systems has been developed: a strategic offense tasked with destroying (through preemptive strikes) as large a fraction of United States strategic weapons as possible; a strategic defense tasked with destroying (in flight) as many as possible of the United States weapons that escape destruction by Soviet offensive strikes; and a Soviet civil defense tasked with minimizing destructive effects on the Soviet population and economy by weapons that penetrate the strategic defenses.

From the sources cited, Deane clearly establishes that Soviet strategic defense requirements are ranked equally with offensive and civil defense requirements and that the building of Soviet strategic defense is not tied to a specific level or trend in United States strategic offensive growth. Evidence indicates that the Soviets will continue an intensive strategic defense research and development program into the 1980s; that they will improve the range and detection capabilities of their intercepters, surface-to-air missiles, and radars; that they may soon deploy a new, mobile antiballistic missile (ABM) system; and that the effectiveness of their ABM defense will be enhanced by introduction of an operational antisatellite capability.

Contrary to the Soviet position outlined above, Deane assesses the current United States position as:

- The abandonment by US officials of the concept of the possibility of successfully surviving a nuclear war.
- A continuation of the strategy of deterring a nuclear war rather than preparing to fight a nuclear war.
- Inaction, due to political rather than technical causes, on a decision for the deployment of any ABM system whatsoever.
- An absence of any short- or long-term intention of developing either strategic or civil defenses.

These differences in the United States and Soviet positions, so states Deane, "virtually guarantee that in case of a nuclear war the United States will suffer defeat and probably annihilation. But the USSR. . .will survive — and with sufficient power intact to establish the world hegemony that its leadership has always considered its ultimate due." As a result, in crisis situations, the Soviets may consider themselves less restrained than does the United States, and act accordingly.

Major Stephen F. Likins, USAR

GUNS IN THE SKY,
by Chaz Bowyer.
Charles Scribner's Sons, New York, 1979. 182 pages, $14.95.

The author, an aviation enthusiast with 26 years of RAF experience, has captured the excitement, skill, and courage of the air gunner in this text. By using several personal accounts of American, British, Australian, and Canadian air gunners, vivid enemy aircraft attacks and bombing raids are recreated.

The origins, developments, and techniques of air gunnery are discussed in detail. However, the experiences graphically recounted by actual air gunners distinguish this book and make it worthwhile reading.

Dorsal gunner in a Lockheed Hudson's mid-upper 'egg' turret.

AMERICA'S ENERGY FAMINE: ITS CAUSE AND CURE,

by Ruth Sheldon Knowles.
University of Oklahoma Press, Norman, OK, 1980. 342 pages, $14.95.

Today the subjects of energy, its source, conservation, and new developments, are of great concern to the people and nations of the world.

The availability and cost of energy in the future will, to a great extent, shape our way of life for years to come. Probably no one is better qualified to treat this subject than the author of the book, *America's Energy Famine: Its Cause and Cure*, Mrs. Ruth Sheldon Knowles.

The author is an internationally recognized petroleum specialist. She has been a petroleum consultant not only to the United States but also to a number of foreign governments and industries. She is a distinguished journalist who during 11 trips around the world has met the leaders and knows many of them on a first-name basis. Although Knowles' primary thrust is on energy, she does spend a good portion of her book discussing the environment. Knowles believes these two subjects are related.

Ruth Knowles begins her book by tracing the beginning of the oil shortage to the Arab-Israeli War, which she calls the international energy war. She tells of King Faisal of Saudi Arabia warning the world, and particularly the United States, of an impending oil shortage. The author says that only 5 percent of America's oil was supplied by the Arabs; however, Western Europe and Japan were dependent on the Arabs for 73 percent and 75 percent of their oil, respectively. The Arabs hoped that by cutting off oil supplies they could force their consumers to pressure the United States to influence Israel to withdraw from occupied territories and make peace. With the nationalization by Libya of 51 percent of all foreign oil companies, (most of which were American owned), the oil war was on.

The author raises some important questions in her book:

- How much is energy going to cost us in the future and why?
- How long will the energy problem last?
- Are we really running out of energy?
- Are the oil companies to blame for the high prices of oil?
- What, if anything, can or should a government do to solve the energy crisis?

Mrs. Knowles examines closely new ways to help in the conservation of energy and the quality of our environment. She cites the presence of the interplay of politics and economics as they affect today's energy problems.

For those sincerely interested in becoming knowledgeable on the subject of the energy shortage and what can be done about it, Ruth Sheldon Knowles' book becomes a must reading. The book gives the reader first-hand knowledge concerning the close relationship between the production of energy and keeping our environment clean. It is the author's considered opinion that self-sufficiency in the area of energy production in the US is a real possibility. However, alternate sources of energy can and must be discovered and developed.

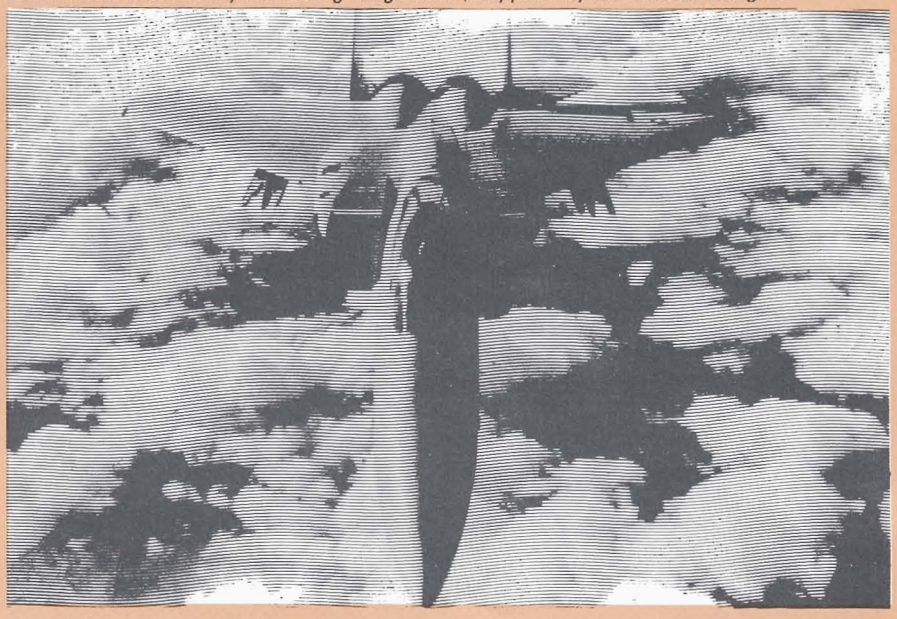
AIRPOWER IN THE NEXT GENERATION,

edited by E.J. Feuchtwagner and R.A. Mason.
Humanities Press, Atlantic Highlands, N.J., 1979. 151 pages, $25.00.

The British Ministry of Defence held a symposium in April 1977 under the auspices of the British University Services Educational Scheme. The theme of this 3-day symposium was, "Airpower in the Next Generation," and 10 papers were submitted and discussed by distinguished speakers in the field of military air power. These papers, accompanied by a summary of the discussions which they prompted, are assembled in this book.

The focus of the symposium was on the future environment in which the Royal Air Force would operate, but the papers and discussions are relevant to anyone who is interested in the changing role of military air power and the Soviet air threat. However, the views expressed in the book are those of the different authors who submitted papers and spoke at the symposium and are not necessarily those of the British Ministry of Defence. Many views and points made are thought provoking and quite controversial.

Below: Photo of F15 by Mr. Georg Wegemann, supplied by McDonnell Douglas.



Senior Air Defense Artillery Commanders

MG Charles F. Means
32d AADCOM

COL Norman E. Jarock
10th ADA Group

COL J. Lapsley Smith
The School Bde

COL Joseph W. House
11th ADA Brigade

LTC James R. Ervin
1st Bn, 1st ADA (Hawk)

LTC Richard G. Kurtz
1st Bn, 68th ADA (C/V)

LTC Larry K. Green
2d Bn, 5th ADA (C/V)

LTC Stephen L. Inman
4th Bn, 61st ADA (C/V)

LTC Edgar L. Wylie
1st Bn, 51st ADA (C/V)

COL William H. Riley, Jr.
9th Inf DIVADA

LTC Zigmund J. Roebuck
1st Bn, 67th ADA (C/V)

LTC Lewis L. Carter
1st Bn, 4th ADA (Hawk)

LTC Dwight K. Robinson
5th Bn, 52d ADA (C/V)

LTC Darrel A. McFerron
3d Bn, 4th ADA (V)

LTC Gerald R. Sullivan
3d Bn, 68th ADA (Hawk)

LTC Robert O. Hays
1st Bn, 3d ADA (V)

LTC Martin R. Hurwitz
2d Bn, 51st ADA (Hawk)

LTC John G. Williamson
1st Bn, 65th ADA (Hawk)

LTC Jim Yancey
2d Bn, 52d ADA (Herc)

LTC Harold D. Carpenter
2d Bn, 55th ADA (Hawk)

LTC Kenneth R. Dolson
1st Bn, 7th ADA (Hawk)

LTC Emmit DeWitt
5th Bn, 57th ADA (Hawk)

LTC Edwin V. Bickerdike
4th Bn, 1st ADA (C/V)

LTC Clyde J. Berkley
1st Bn, 55th ADA (C/V)

LTC Melvin M. Adams
Student Bn

LTC R. R. Matlick
Staff & Faculty Bn

LTC T. J. Camp
Allied Student Bn

COL John F. Crater
1st ADA Tng Bde

LTC Robert B. Tinsman
3d ADA Tng Bn

LTC Wilburn R. Causer
4th ADA Tng Bn

LTC Lawrence Anderson
Instructor Group

LTC Robert S. Hardy
2d Bn, 2d ADA (Hawk)

LTC Eddie L. Brandon
2d Bn, 62 ADA (Hawk)

LTC Frank T. Smith
3d Bn, 59th ADA (Hawk)

COL Donald R. Infante
69th ADA Group

LTC James Kress
3d Bn, 7th ADA (Hawk)

LTC Chapin Horton
2d Bn, 57th ADA (Hawk)

As of 1 January 1981

COL William F. Winzurk
94th ADA Group

LTC Joel H. Ward
2d Bn, 1st ADA (Herc)

LTC Newton F. McCurdey
5th Bn, 6th ADA (Herc)

LTC Miguel A. Garcia
2d Bn, 56th ADA (Herc)

LTC Gary E. Epperson
3d Bn, 71st ADA (Herc)

COL James C. Cercy
108th ADA Group

LTC Roger L. Andrews
2d Bn, 67th ADA (C/V)

LTC Louis R. Clark
2d Bn, 60th ADA (C/V)

LTC Phillip E. Holman
6th Bn, 56th ADA (C/V)

LTC Jay M. Garner
2d Bn, 59th ADA (C/V)

LTC James J. Cravens
3d Bn, 61st ADA (C/V)

LTC Ralph L. Allen
3d Bn, 67th ADA (C/V)

LTC Carlton H. Smith
1st Bn, 59th ADA (C/V)

BG Victor J. Hugo
38th ADA Bde

LTC Gilbert Stieglitz
1st Bn, 2d ADA (Hawk)

LTC George B. Eveland
2d Bn, 71st ADA (Hawk)

LTC Peter Swenson
2d Bn, 61st ADA (C/V)

LTC Dale L. Simpkins
1st Bn, 62d ADA (C/V)

COL Robert W. Annette
559th USA Arty Group

LTC Brian Flynn
5th USA Arty Group

LTC Herbert A. Walker
6th Bn, 52d ADA (Hawk)

LTC Gary Q. Coe
3d Bn, 60th ADA (Hawk)