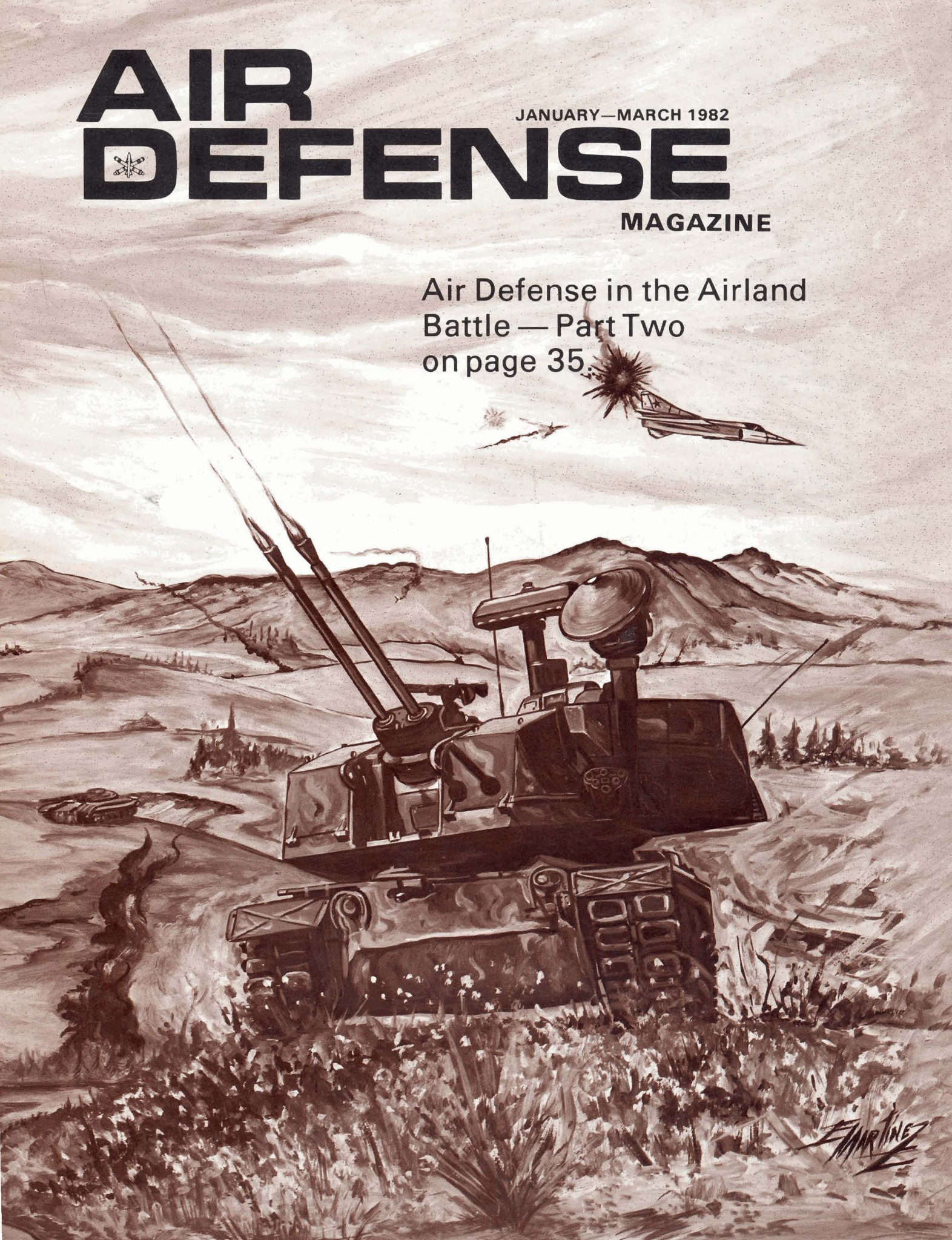
AIR DEFENSE MAGAZINE

JANUARY—MARCH 1982

Air Defense in the Airland Battle — Part Two on page 35.



AIR DEFENSE MAGAZINE

Secretary of the Army
John O. Marsh, Jr.

USAADS

Commandant
MG John B. Oblinger, Jr.

Assistant Commandant
BG Archie S. Cannon, Jr.
CSM Charles Toynes

Deputy Assistant Commandant
COL Thomas J. Manning

DIRECTORATES

Training Developments
COL Otto R. Schulz
SGM Archie W. Hartsfield

Combat Developments
COL Russell W. Parker
SGM James H. Larson

Training & Doctrine
COL James J. Kernan
SGM Floyd L. Norton

Support
MAJ Van A. Collins

Evaluation & Standardization
LTC Richard B. Wessling, Jr.

UNITS

The School Brigade
COL Travis N. Dyer
CSM Raymond H. Godfrin

1st ADA Training Brigade
COL Edmond S. Solymosy
CSM Pete Dawkins

USAADCEN

Commanding General
MG John B. Oblinger, Jr.
CSM Frederick T. Stafford, Jr.

Deputy Commander
COL J. Hollis V. McCrea, Jr.

Chief of Staff
COL J. Lapsley Smith

Headquarters Commandant
LTC Antonio G. Gonzales
CSM Alfred D. Elder

UNITS

11th ADA Brigade
COL Gerald H. Putman
CSM Donald R. Harrington

3d Armored Cavalry Regiment
COL William A. Fitzgerald
CSM Jack H. Schmidt

Range Command
COL F.W. Atkinson, Jr.
CSM Twyman D. Kirkpatrick

US Army Air Defense Board
COL Philip E. Holman
SGM Jessie Chandler

TRADOC SYSTEM MANAGERS

Roland —
COL Ronald L. Peden
Patriot —
COL Kurt L. Keene
DIVAD Gun —
COL Charles C. Clarke, Jr.
Stinger —
COL James E. Leach

AIR DEFENSE MAGAZINE: Published quarterly by the US Army Air Defense School to keep air defense personnel informed of the latest tactical, doctrinal, and technical developments in air defense worldwide, and to maintain a stimulating and mutually productive dialog between the School and units in the field, with a view toward increased efficiency in all aspects of air defense. Articles appearing in this publication do not necessarily reflect the position of the US Army Air Defense School or the Department of the Army. Material submitted for publication is subject to edit by the AIR DEFENSE Magazine staff. Footnotes and bibliographies may be deleted due to space limitations. Use of the masculine pronoun is intended to include both genders where appropriate. Unless copyrighted or syndicated, material may be reprinted. Please credit AIR DEFENSE Magazine and the author.

Use of funds for printing of this publication was approved by Headquarters, Department of the Army, 25 April 1980, in accordance with AR 310-1.

SUBSCRIPTIONS: Subscriptions may be obtained through the Custodian, US Army AIR DEFENSE Magazine Fund, USAADS, ATTN: ATSA-TDL-S, Fort Bliss, Texas 79916. The rate is $4.00 per year domestic and $5.00 overseas. Make checks payable to: **TREASURY OF THE UNITED STATES.**

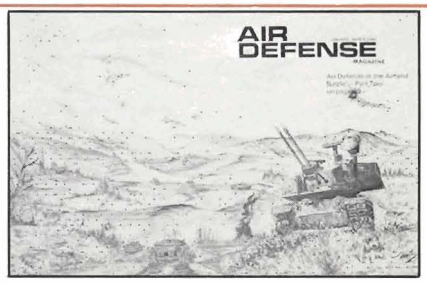
CORRESPONDENCE: Address articles and letters to: The Editor, AIR DEFENSE Magazine, USAADS, ATTN: ATSA-TLD-S, Fort Bliss, Texas 79916. Telephone 915-568-5603 (AUTOVON 978-5603).

POSTMASTER: Controlled Circulation postage paid at El Paso, Texas 79916, Department of the Army (DOD 314) AIR DEFENSE Magazine (USPS 307-010).

This publication contains no advertising.

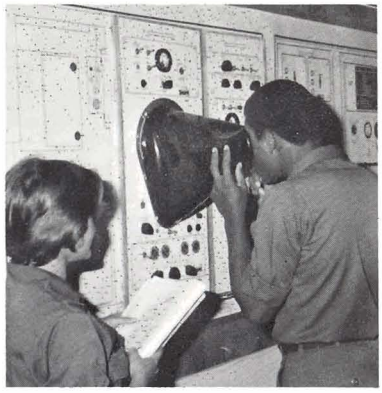
About the Cover

The cover illustration designed by Fort Bliss artist Ernesto Martinez depicts the DIVAD Gun in action at the forward edge of the battlefield. Martinez' paintings and murals, which include "The Resurrection" in the dome of St. Joseph's Catholic Church in Houston, have won him a listing in *Who's Who in American Art* and a reputation as one of the Southwest's leading artists.



FEATURES

PAR FLAT PANEL SYSTEM SIMULATOR 21
SOVIET MOTORIZED RIFLE BATTALION HELIBORNE ASSAULT 30
AIR DEFENSE IN THE AIRLAND BATTLE— Part Two: Contingency Areas 35



page 21

ARTICLES

AN/TSQ-73 Integration with Marine TAOC 6
The Guard Comes to Fort Bliss 10
EMP: An Increasingly Important Nuclear Weapons Effect 12
SHORAD vs AIR CAV (Everybody Wins) 16
Soldiers Applaud TEC Lessons 19
America's Commitment to Freedom 20
11th ADA Brigade Learning Center 24
Communications in the ADA Battalion 26
Scope and Nature of the ADA Officer Basic Course 32
What Do You Do Now, Lieutenant? 39
Lineage and Honors 41

page 30

DEPARTMENTS

Intercept Point 2
Engagement Zone 4
Scanning 45
Enlisted Career News 46
Bars to Stars 48
Bulletin Board 49
Combined Arms Corner 51
Developments 54
Intelligencewatch 56
Books 57
Senior Air Defense Artillery Commanders 61

page 35

Looking ahead. . .

The April-June issue of AIR DEFENSE Magazine will explore the technology of covert/passive air defense sensors which promise to revolutionize air defense target acquisition. The same issue will chronicle the arrival of the first Stinger cadres at Fort Bliss, Texas, as the Army takes the initial step toward converting its Redeye units to Stinger units.

AIR DEFENSE

"The Bridge over the Chasm of Defeat."

Editor
William Blair Case

Assistant Editor
Linda Pirino Ross

Art Director
Terry G. Smith

INTERCEPT PO

Major General John B. Oblinger, Jr.

In this Intercept Point I want to discuss air defense training for tomorrow's airland battle; that is, how corps and divisions should train to use air defense artillery in combat. We must not forget that it is the responsibility of all of us who are air defenders, especially those assigned to corps and divisional staffs and units, to insure that air defense is fully integrated into exercises and training programs throughout the Army. Further, we must make sure that we are providing other members of the combined arms team with all of the current information necessary to make those training programs and exercises meaningful and productive to both air defenders and their supported units. Following this theme, here are some training thoughts upon which I would like you to reflect.

First, in the division forward area, approximately 80 percent of the aircraft attacking our maneuver units will be attack helicopters. Visual aircraft recognition training is therefore a real need for all units — not just air defense. Small arms air defense training is a must. As you know, this is an ARTEP task and it should be included in all exercises.

Next, we must emphasize to all commanders that tomorrow's battle will find them with insufficient air defense elements to protect everything they might wish defended. Risks will have to be taken in a number of areas, but the important point is to reduce the risk of mission failure due to air attack. As much as possible, the maneuver commander must determine the defense priority of his assets. Then, in concert with his supporting ADA commander, he will decide which or how many of these assets can be defended. This process must be included in every type of training exercise by company, battalion, and brigade size forces (as well as by divisions and corps). It is particularly important that air defense staff training be included in these exercises at all levels, to include those conducted at the National Training Center.

Keep in mind that air defense is an integral member of the combined arms team and should be included in every training exercise. The practice of habitual association of divisional ADA batteries with respective brigades can be of value in training because it familiarizes each command with the practices and techniques of the other. However, on tomorrow's battlefield, maneuver echelons will be supported by different and changing ADA task organizations with varying missions. Different type assets will receive different supporting air defense both within and between various operational phases — Chaparral will not always defend the tactical operations center nor Vulcan the covering force. Consequently, maneuver training must include provisions for support by varying ADA task organizations in defense of quickly changing priorities. Also, just as the ADA unit must reorganize its responsibilities in each potential mission, the supported unit must know what it can and cannot expect of a supporting ADA unit in receipt of a specified mission.

Supporting ADA units must be totally integrated into the supported unit's scheme of maneuver. It is imperative, therefore, that the liaison and communications links between these units be repeatedly exercised under different scenarios. Channels for transmission of vital information, such as impending unit movement by either the maneuver or supporting ADA unit, must be

determined. Firm procedures for both the supported and supporting units should include provisions for air defense operations in autonomous situations.

Liaison, communications, and coordination requirements cannot be overemphasized and do not merely relate to supporting divisional air defense artillery. Questions like those below must be answered:

- How will you request HIMAD be positioned forward?
- How will you call for counterair support or request additional ADA assets?
- How will you request weapons free zones and/or high-density airspace control zones?
- How and when will you change Vulcan from air to ground role?

The weapon control status in effect must be answered for each maneuver echelon and workable procedures established and practiced. The integration of HIMAD coverage and counterair support into the total divisional and corps air defense plan must be planned for and practiced. The maneuver commander must recognize that not only his divisional ADA units but also any HIMAD units positioned in his area have valid demands on his attention regarding position selection, unit movement and, consequently, integration into the scheme of maneuver. Likewise, the maneuver commander must recognize that the role he plays in air defense control encompasses more than just establishing priority of his assets. For instance, scenarios should be developed and exercised using Vulcan in both the ground and air roles, alerting the ADA weapons control status at the maneuver level and at corps and division level, and receiving a dedicated HIMAD organization in support.

Finally, I must emphasize the importance of passive air defense training and early warning. In many areas, passive air defense will be the sole means for the maneuver commander to reduce his risks on the battlefield. Consequently, these measures must receive great emphasis during training and actual operations. Likewise, the presence of battlefield air attack alerting information offers an invaluable service to all commanders, both as regards the subsequent engagement of these aircraft and physical unit preparation for attack. Current alerting systems must, therefore, be more workable; i.e., communications equipment must be adequate in amounts and in range. Communications must be standardized so that message language is the same among all units. Alerting systems must be exercised to the fullest, and consideration should be given to their application and exercise in the corps.

In conclusion, the foregoing elements must be incorporated into training today if we are to fight tomorrow's airland battle successfully. The problem for ground commanders at every level is how to integrate every battlefield capability available in a coordinated effort to win the battle. Air defense artillery must be prepared to assist the ground commander in fully integrating ADA with the commander's plan of maneuver. At the same time, it must be flexible enough to permit changes as it becomes necessary to shift the maneuver or the ADA support or both. By fully exploiting our weapons capabilities in a fully integrated effort, we can and will win the airland battle.

John B. Oblinger

ENGAGEMENT ZONE

letters to the editor

FROM AN EXCHANGE OFFICER IN ENGLAND

Dear Sir:

The 22d Air Defense Regiment, Royal Artillery, hosts an American exchange officer who works as an integral part of a Rapier battery with respect to daily operations, deployment, and maintenance. Presently, I am fortunate enough to be that exchange officer and, as such, I hope to be of some service to the US Army Air Defense School.

Following is a brief paragraph on the Rapier system that should interest our air defense artillerymen. I request that it be included in AIR DEFENSE Magazine. It is a bit scant, but will at least provide a contact reference for future information purposes.

Rapier is a short-range air defense, optically guided weapon system deployed primarily for area and vital point defense of combat maneuver and support elements of the 1st British Corps. In its towed configuration, it is highly mobile, air portable, and capable of quick deployment. The system is autonomous, containing both surveillance and missile command guidance radars, IFF, an optical tracker, and power source.

The 22d Air Defense Regiment welcomes the opportunity to exchange training and weapon systems information with both CONUS- and USAREUR-based air defense units. The address is:

CPT Steven E. Garner,
42 (Alem Hamza) AD Btry
RA, BFPO 20: Dortmund
Military 02301 2501 563,
England.

I can also be reached at the address below.

S. E. GARNER
CPT, AD
TEAM B, 66th USA Det
APO NY 09078

AN OPEN LETTER

To all Army public affairs officers, editors, chiefs, and personnel who influence soldiers, NCOs and officers:

Millions of dollars and manhours have been invested in the development of programs to train the best army in the world. The Army Training Extension Course (TEC) is prominent among these programs. It is designed by proponent schools and agencies to train skill level 1 and 2 soldiers in their own military occupational specialties (MOS). There are lessons for every high-density MOS. TEC is referenced in soldier's manuals. It's helpful in preparation for skill qualification tests (SQT). According to Army Research Institute (ARI) studies, TEC is more effective than conventional training.

TEC is used most frequently to train small groups of 10 or less, or individual soldiers. Instructors use it as refresher material for themselves.

TEC is presented in different media. Some lessons are on cassette tape while others are printed. The most popular and widely used lessons are audio-visual on super 8-mm film synchronized with audio cassette tapes. Lessons are viewed and heard on a Beseler Cue/See sound projector, similar to a small TV set. A projector is used for larger groups.

TEC lessons stop automatically when there are questions to answer or tasks to perform. The lesson moves on when the "proceed" button is touched. Lessons require one-half to one hour and can be repeated as often as necessary. The Cue/See is a great training tool.

The Army has distributed 30,000 Beseler Cue/Sees to Active Army, National Guard, Reserve Component, and ROTC units worldwide. More than 2,000 different TEC lessons have been sent to 8,000 account holders. Millions of TEC lessons are already in use.

Soldiers can use TEC on their own or during scheduled training time. Surveys and experience show TEC is used most when it receives command emphasis. Many soldiers are unaware that TEC is available to most Army units. Many who know about TEC are not using it.

TEC has been in the field for more than 6 years. Articles, flyers, and posters about TEC have appeared in Army newspapers, magazines, bulletins, and related media. Despite wide-

spread coverage and exposure, TEC remains unknown to a large number of soldiers, including NCOs and officers.

TEC needs media cooperation and support to spread the word about this dynamic training resource. We will provide items of interest to promote the awareness and use of TEC. Comments, suggestions, criticism, and assistance are invited. The point of contact is Jerry Perlman at AUTOVON 927-4603/4/8 or commerical (804) 878-4603/4/8, or write to:

Commander
US Army Training
Support Center
ATTN: ATIC-AET-TP
Fort Eustis, VA 23604

A REQUEST FROM DOWN UNDER

Dear Sir:

The Australian Staff College is interested in the AIR DEFENSE Magazine as an item of curriculum support. The Australian Staff College is the equivalent of the US Army's Command and General Staff College, with a multinational faculty and classes representing some 15 countries in addition to the three Australian services. The teaching of air defense doctrine and principles forms an integral part of the basic, operational, and joint studies at the college; however, very little information in a format such as AIR DEFENSE Magazine is available in country.

The magazine would be circulated through the Commandant, Deputy Commandant, and interested associated subject sponsors and then placed in the college library for general use.

WILLIAM F. KELLY
COL, FA
US ARMY
Exchange Instructor

We are pleased to be of service to you and to the Australian Staff College.

—Ed.

MINISERIES GRAPHIC STUDIES

Dear Sir:

I was quite pleased with the way you presented my study, "Soviet Motorized Rifle Battalion (Reinforced) in the Defense." Several more ministudies have been completed and if you would like copies of them for publication, please let me know. The subjects are:

Soviet Motorized Rifle Battalion (Reinforced) in the Advanced Guard Role.

Soviet Tank Battalion (Reinforced) in the Advance Guard Role.

Soviet Motorized Rifle Battalion (Reinforced) in the Attack Posture.

Soviet Tank Battalion (Reinforced) in the Attack Posture.

Soviet Motorized Rifle Battalion in Heliborne Assault.

Soviet Threat to US Army Rear Area.

Soviet Motorized Rifle Battalion (Reinforced) in the Defense.

Main Body of a Soviet Reinforced Tank Regiment in the Approach March.

DALE D. BEST
Chief, General Intelligence Br.
TRADOC Threat Directorate
Fort Monroe, VA

Thank you for your kind words and especially for offering the other ministudies. These are subjects that will keenly interest many of our readers.

—Ed.

USARNG SENIOR COMMANDERS

Dear Sir:

The purpose of this letter is twofold. First, I wish to thank you for your excellent magazine and for your untiring efforts to keep air defenders around the world informed of current events and developments in the many areas that interest us. Personally, I am especially grateful for your periodic publication of a listing of the senior air defense artillery commanders. As it has so many times in the past, your most recent listing allowed me to locate old acquaintances with whom I had lost touch. My second purpose in writing is to suggest that the senior commanders list is incomplete. There are at least nine senior ADA commanders who were not included in the last list.

With the increased emphasis in recent years on the Total Army concept, I have noticed more and more articles about the Reserve Components in AIR DEFENSE Magazine. I wonder how many of your readers realize that eight Army National Guard "Duster" battalions and one National Guard ADA brigade headquarters are an integral part of the Total Army? In my duties over the past 2 years as an active duty advisor to one of these battalions, I have found that the enthusiasm and dedication of these guardsmen are second to none. By including the names and organizations of these National Guard air defense commanders in the senior commanders listing, we would be formally recognizing the significant role they and their units play in the air defense of the Total Army.

CHARLES L. FRAME
MAJ, ADA
US Army Readiness Group
Patrick Air Force Base, FL

Your complimentary remarks are appreciated, and we agree that the ARNG senior AD commanders should be included in the listing. They appear in this issue.

—Ed.

AN/TSQ-73 INTEGRATION WITH MARINE TAOC

by Captain Robert N. Moschini

The interior of the AN/TSQ-73 is shown at the start of exercise BORDER STAR '81. Maps of the southwest region are clearly displayed on both consoles.

Editor's Note: *BORDER STAR '81 was an unprecedented field exercise for US Forces and reports on valuable experiences are still surfacing months later. We have published several and are confident that many of our readers will be pleased that we have added this one.*

One of the many objectives of Exercise BORDER STAR '81 was to establish interoperability by integrating various command and control systems in a tactical environment. This system of integrated units was to involve elements of the US Marines and US Air Force along with US Army systems in a brigade-size air defense task force.

The nondivisional Army air defense artillery (ADA) task force for the exercise consisted of the entire 11th ADA Brigade with its three Hawk battalions and Chaparral/Vulcan battalion operating in three air defense sectors. This article discusses the integrated air defense system (IADS) in the US Marine Corps-controlled sector. The command and control system was the AN/TSQ-73 Missile Minder of the fire direction center (FDC) of the 1st Battalion (Hawk), 65th Air Defense Artillery (1/65th ADA), Fort Bliss, Texas. The Air Force elements were a part of the 12th Air Force from Bergstrom AFB, Texas. The Commander, Marine Forces (COMMARFOR), was from the Marine Air Control Group-28 (MACG-28), Cherry Point, North Carolina. The Marine Air Control Squadron-6 (MACS-6), a part of MACG-28, provided the tactical air operations center (TAOC) during BORDER STAR '81.

INITIAL SETUP

The mission of the 1/65th ADA was to defend the northernmost section of White Sands Missile Range (WSMR), 150 miles due north of Fort Bliss. In this case, the initial setup was a situation scenario wherein the Marine elements were already deployed in an area to be joined by the Army elements on the ground and the Air Force in the air. The battalion was using five fire units (FUs) made up of four Hawk assault fire units (AFUs) and one battery minus. The battalion was placed under the operational control of the Marine TAOC. The TAOC consisted of three main sections: weapons assignment, identification, and air traffic control. Additionally, the TAOC controlled three Marine Hawk FUs.

One week prior to the start of BORDER STAR '81, the 1/65th ADA moved by convoy from Fort Bliss and assumed tactical positions in the vicinity of Stallion Army Airfield, some 200 miles north of Fort Bliss. During this time, the battalion FDC was collocated with the battery-minus element. The FDC consisted of the AN/TSQ-73 and a Hawk pulse acquisition radar (PAR) serving as the battalion defense acquisition radar (DAR).

Tactical operations and checks were conducted between the AN/TSQ-73 and FUs with emphasis on system integrations using the Army tactical data link-1 (ATDL-1). ARTEPs were also conducted along with

SQT evaluations. Once these tests were completed, the FDC and the battalion's communications-electronics (C-E) element deployed to join the TAOC on North Oscura Peak—15 miles from Stallion and 3,000 feet above the desert floor.

TACS-TADS INTERFACE

The AN/TSQ-73 is a versatile command and control system that can interface with a wide variety of systems of the other services. Previous attempts had been made to integrate an AN/TSQ-73 of another battalion with the Marine TAOC. BORDER STAR '81 would provide the greatest challenge to date for the accomplishment of the entire tactical air control system-tactical air defense system (TACS-TADS) interface.

Normally, the FDC would collocate with a fire unit and deploy tactically, but during BORDER STAR '81, it was decided to collocate with the TAOC to take advantage of the direct contact and enhance the technical operation of the two systems, should any problems arise.

The goal of this operation was to provide an interface that would employ all the available services. The TAOC, which has its own acquisition radar capability, would tie into the 1/65th FDC using the tactical digital information link-B (TADIL-B). The FDC, in turn, would control its FUs via the ATDL-1.

The TAOC was interfaced with the Air Force control and reporting center (CRC) using a TADIL-B link. The CRC also tied into the 11th Brigade FDC (another AN/TSQ-73) which in turn controlled the remaining battalions of the brigade. A contingency plan had been established in the event the TAOC was rendered nonoperational whereby the brigade FDC would assume operational control of the 1/65th ADA. Rounding out this entire TACS-TADS interface was an Air Force E-3A AWACS aircraft which provided early warning information to the TAOC via TADIL-A data link. A TADIL-A is used with Air Force and Naval elements to provide data to a facility such as a TAOC. The AN/TSQ-73 was not designed to interface directly in a TADIL-A net. The CRC is normally collocated with an Air Force message processing center (MPC), which converts TADIL-A to TADIL-B for the CRC and Army FDCs. This further highlights the importance of successfully integrating with the TAOC. With a proper integration, the FDC can receive a wide variety of air defense information from multiple sources.

FDC/TAOC INTEGRATION

The first step in the integration process was to physically tie in the 1/65th FDC with the MACS-6 TAOC. The opportunity for this operation occurs rarely. Normally, UHF/VHF radio communications equipment is used to establish the data links. Secure voice communications are also established in this manner. However, the two systems were collocated so that they could "hard-wire" into each other. The UHF/VHF equipment was used by the FDC to communicate with the 11th Brigade and the FDC's own battery.

Between the FDC and TAOC, a shielded data communications cable was run from the "data comm" patch panel on the exterior of the AN/TSQ-73 to the SB-611 patch panel of the TAOC. From there, the TAOC made the necessary wiring adjustments to accept the AN/TSQ-73 and make the two systems compatible. Once the appropriate computer commands were initiated, a TADIL-B data link was established.

For 3 days prior to the start of the exercise, extensive checks and system integrations were conducted using procedures found in SOPs of both the 11th Brigade and the TAOC. These integrations checked the validity of the automatic data links, computer commands, and assignments from the TAOC through the FDC and down to the FUs. Return responses from the FUs were also evaluated. When these checks were completed, participants turned their attention to the exercise and the conduct of the air battle.

CONDUCT OF THE OPERATION

Normally, the battalion FDC operates only with other Army units. During BORDER STAR '81, because the FDC would be working with the Marines and the Air Force, the subtle differences in tactical and standard operating doctrine had to be worked out. This was done for the most part in coordination meetings conducted prior to BORDER STAR '81. A meeting between the various staffs was also held at the start of the exercise. Periodically throughout BORDER STAR '81, other meetings were held as the need arose. Tactical report formats were shared and in some cases one service adopted the report format of another.

The tactical operations consisted of the TAOC assigning a hostile target to the FDC via TADIL-B, which in turn assigned it to one of the FUs for engagement. The TAOC received target information from its own radars, the CRC, the AWACS, and the FDC or the FU for evaluation. Aside from assigning hostile targets, the

TAOC was an air traffic controller for friendly aircraft. After the FU completed the assignment, the results were reported by the FDC to the TAOC by data link or voice.

During most of the exercise, these data links were used exclusively in accordance with prescribed doctrine. The data link between the FDC and TAOC remained operational throughout the exercise. At times exercise inputs were introduced requiring the use of manual voice procedures to control the air battle. During one power failure at the FDC, the FUs worked on their own until control was reestablished, and the results were quite effective. The entire system worked at its best when the entire TACS-TADS interface was used for optimum control. In all cases, switchover from one controlling agency to another was accomplished without seriously degrading the ability to fight the air battle. This was clearly demonstrated during the most complicated switchover conducted during BORDER STAR '81. The TAOC was "removed" by exercise input and the FDC was directed to establish a data link with the 11th Brigade FDC as the contingency plan required. Since the brigade FDC was located approximately 100 miles south of the 1/65 ADA, a UHF/VHF radio shot, consisting of two relays, had been established by the 11th Brigade and 1/65th ADA C-E Sections. The shielded data cable was disconnected from the TAOC and connected to the AN/TRC-145 shelter. Voice and data communications were established and the proper computer commands were entered into the system to establish an ATDL-1 data link. At that time, the 1/65th FDC came under operational control of the 11th Brigade FDC. During the less than one-half hour that this switchover was being made, the FUs of the 1/65th ADA conducted an air battle while being monitored by voice from the battalion FDC.

At that point, another exercise input restored the TAOC to the interface, and the FDC was directed to return once again to TAOC control. The data link reconfiguration was accomplished in less time and normal tactical operations resumed. Although no tactical operations were conducted with the brigade FDC, the evaluation input, under simulated emergency conditions, proved that such a drastic change could be made smoothly and properly to restore control of tactical operations to the best and highest level possible.

During BORDER STAR '81 the 1/65th FDC and the TAOC had an opportunity to work in two other areas in which success had been achieved: working with the AWACS and working against electronic countermeasures (ECM).

The AWACS was airborne and was tied to the TAOC via TADIL-A data link. During part of the exercise, technical difficulties with the AWACS' radar did not allow for maxium use of this aircraft. When radar early warning data were being received by the TAOC, the information was extremely valuable. Voice communications to the AN/TSQ-73 from the AWACS was made possible through the HF/SSB AM (AN/GRC-106) radio.

ECM was used against the TACS-TADS interface during BORDER STAR '81, but at least one agency (Army, Marine, or Air Force) always retained a capability for observing target video. This demonstrated another positive aspect of the interface's ability to work in an integrated effort.

One of the techniques used by the FUs against antiradiation missiles (ARMs) is a procedure that has been developed successfully in the 1/65th ADA known as snap-shoot. This involves the FDC designating one of the FUs to act as the acquisition element for the entire battalion. This reduces the number of radars normally on the air. Prospective targets are detected by the acquisition unit and passed via data link or voice to the battalion FDC and then to one of the FUs. The designated FU obtains high-powered illuminator radar (HIPIR) lock on the target and proceeds with the engagement. Afterwards, all FUs go to a standby condition until they receive another assignment. During BORDER STAR '81, the TAOC acted as the acquistion element. The goal was to minimize the amount of radar use while maximizing the effective engagement of targets. This procedure is always used when the threat of ARMs is present. Once the threat passes, normal operations resume.

Snap-shoot was used to its maximum effectiveness during BORDER STAR '81 when the TAOC was the acquisition element. An additional benefit derived from this technique provided an electronic counter-countermeasure (ECCM) that allowed the FUs to operate much more effectively in an ECM environment. The fewer radars on the air at any one time, the fewer jamming opportunities provided the aggressor. If one element is jammed, a rapid switch can be made to another radar.

Prior to BORDER STAR '81, the 11th Brigade conducted a field exercise in which the AWACS was used successfully

to pass early warning directly to the FDC by voice. Snap-shoot was also practiced extensively, along with the concept of using the PAR with the AN/TSQ-73. All of these operations were tested to prepare for BORDER STAR '81 and, as successful as these operations were considered to be, the best was still to come.

LIVE FIRE: TACS-TADS STYLE

Another objective of BORDER STAR '81 was to conduct a live Hawk missile firing, using the TACS-TADS interface for command and control. This was accomplished on the morning of 5 April 1981 using Battery D, 1/65th ADA.

A simulated air battle had been conducted prior to the live fire using, as had been the case throughout BORDER STAR '81, actual aircraft and simulated missiles. During the live fire, a drone was engaged by a live round. The conduct of the firing was done under tactical conditions, with evaluations occurring at both Battery D and the FDC.

Once the airspace around the range was cleared, the drone was launched, acquired by the TAOC and assigned for engagement via the data link to the FDC, which in turn acknowledged the assignment and passed it to the firing battery, again via data link. The battery accepted the target, tracked it, and fired one round. The missile impacted with a direct hit on the drone. Throughout the entire sequence, the TACS-TADS interface performed flawlessly. The live fire was one of the most satisfying experiences for everyone participating in BORDER STAR '81. At the conclusion of the live firing, normal tactical operations continued until the end of the exercise.

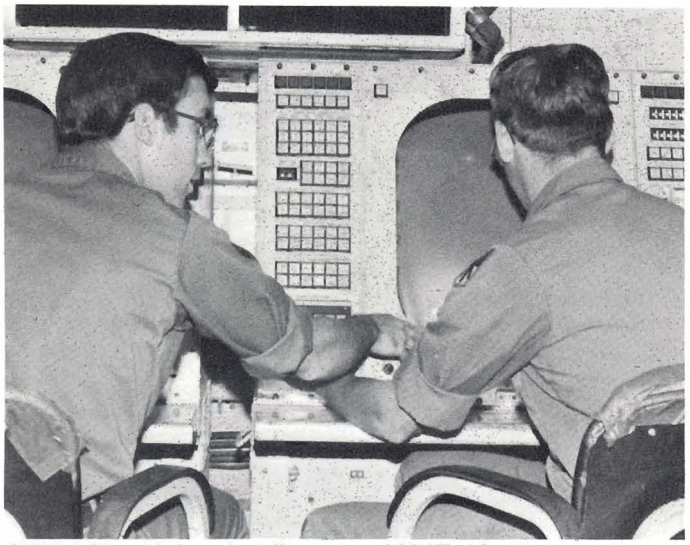
SUMMARY

The motto of the 11th ADA Brigade is "Gotcha Covered" and the philosophy expressed by that motto came to describe precisely the manner in which operations were conducted by the entire TACS-TADS interface—all areas of the operation were covered at some time or another.

Exercise BORDER STAR '81 proved the effectiveness of the TACS-TADS interface, which consisted of elements from three of the services. The complete integration of US Army (FDC and FUs), US Marine Corps (TAOC and FUs), and US Air Force (CRC, MPC, and AWACS) was accomplished successfully. Varying tactical procedures were conducted and the services had the unique opportunity to coordinate and share ideas, concepts, and experiences in sustained operations.

These operations during BORDER STAR '81 paved the way for more advanced evaluation of the TACS-TADS interface. For example, in future exercises, the FDC will be deployed tactically at a much greater distance from the TAOC and collocated with a fire unit. Continued work with the AWACS is essential and every opportunity to do so should be exploited. A possible exercise scenario at a port shore location would allow Naval participation whereby all of the combat services would be involved.

In modern warfare, no single service, weapon system, or agency can operate and survive alone. A combined effort is needed to bring out the best that everyone has to offer and achieve maximum effectiveness and optimum results. The successful integration of the AN/TSQ-73 and the TAOC during Exercise BORDER STAR '81 is a positive step in that direction.



CPT Bob Moschini, tactical director, and SP4 Ted Smith, his assistant, test the systems display consoles as part of their preparation for Battery D's live missile firing.

CAPTAIN MOSCHINI *is a graduate of Rutgers University. He has served in various ADA assignments in the Continental United States and Germany and is currently a tactical director in S3, 1st Battalion, 65th Air Defense Artillery, 11th ADA Brigade, Fort Bliss, Texas.*

The trail was hot and dusty as the M42s rolled across the desert. It was not even noon, yet the surrounding air was rapidly becoming uncomfortable because of temperatures that already neared 100°. Surely the soldiers' stamina would be tested during the maneuvers that lay ahead. However, this was not to be a day of fighting. It was to be a day of learning.

The Guard Comes to Fort Bliss

from information provided by
LTC EDWARD D. BACA and 2LT VICTORIA M. CHAVEZ,
New Mexico Army National Guard

Last summer, almost 400 Army National Guard trainees, representing M42 Duster battalions from New Mexico, Florida, Ohio, South Carolina, and Virginia, took their basic and advanced individual training (AIT) at Fort Bliss, Texas. That fact may not sound terribly unusual; however, the training situation was decidely unique.

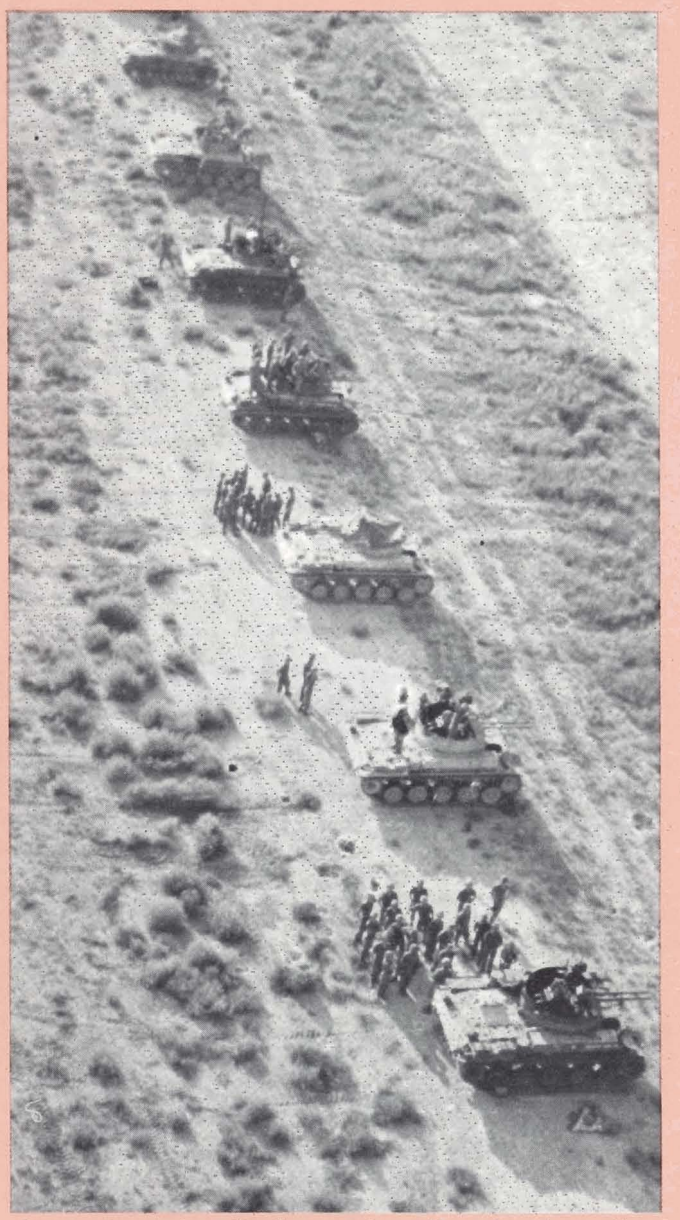
To begin with, the Guardsmen were training on the Duster air defense gun, which is no longer in the Active Army inventory. It meant that even though the instruction took place on an installation that specializes in air defense training, all the equipment and instructors for the AIT portion had to be provided by the National Guard.

Something else was unique as well. It was something that might go undetected unless you happened to notice the unusual amount of camaraderie displayed throughout the 12 weeks of training. The reason for the camaraderie was the fact that most of the trainees were part of the New Mexico Army National Guard's innovative Buddy Battery Program.

The buddy program is relatively new. In 1977, after several programs failed to bring in the quantity and quality of recruits needed to fulfill the New Mexico Army National Guard's air defense mission, LTC Edward Baca initiated the concept of sending high school juniors and seniors to basic training and AIT with others of their community, school, and state. Because they would join up and train together, it was hoped that feelings of comradeship would be enhanced.

The idea worked. Initially, 81 troops were recruited for the buddy program, but the number increased steadily to 193 recruits the second year and 330 the third year. Last summer, more than 370 recruits from New Mexico arrived at Fort Bliss to take basic and advanced training along with individuals from Duster units in other states.

The training began with a short reception station period, then continued with the standard basic training and AIT. The Guardsmen learned such things as operating procedures and mainte-



Dusters line up for a live-fire exercise at Dona Ana Range, New Mexico.

National Guard soldiers learn operation and maintenance of the M42 Duster air defense gun.

nance of the M42 Duster; target acquisition; field stripping, loading, and unloading of the twin 40-mm gun; crew drills; and use of controls and indicators. The students also participated in practice fire exercises at the Fort Bliss Dona Ana Range in New Mexico. Only aircraft recognition and driver training were not taught at Fort Bliss. These subjects are taught by the National Guard at unit level because they can be continually reinforced and because retention is better than when the material is taught quickly during AIT.

When the 12 weeks of training ended, all trainees were awarded the 16F MOS (Light Air Defense Artillery Crewman). For them graduation was a time of great celebration. They could now return home and begin serving 6-year contracts as fully trained Army National Guardsmen.

For the New Mexico National Guard, the graduation meant that its strength was now above 100 percent and it was evidence that the buddy system was working.

In reflecting on the success of the program, LTC Baca stresses the importance of the cooperation and support the Guard receives each year from Fort Bliss and its cadre, especially the members of the 1st ADA Training Brigade. Everyone involved is "Total Force" oriented. And the results are evident in the graduates. The attrition rate is down and the National Guard is getting better than average soldiers because of the maturity, skill, and desire gained through the program. Educators, families, and communities alike totally support the New Mexico National Guard.

An event that occurred on graduation day was further testimony to the tremendous success of the Buddy Battery Program. Sixty-six of the 1981 graduates were from five American Indian tribes in New Mexico. For the graduation, the Taos Indians sent their special ceremonial dancers to Fort Bliss to take part in the festivities. Their performance in traditional dress was enjoyed by everyone in attendance and, although such a sight would have been shocking on an old cavalry post, it proved to be a wonderful show of support for the National Guard and its newest air defense soldiers.

Ceremonial dancers from the Taos Indian Reservation, New Mexico, take part in the National Guard's 16F graduation festivities at Fort Bliss.

Acknowledgments

The bulk of the material presented in this paper may be found in any of several reference works on EMP and is thus uncredited. However, *The Effects of Nuclear Weapons,* edited by Samuel Glasstone and Philip J. Dolan, proved to be a handy and complete source and I fully recommend it to the reader. I also wish to give general credit to the instructors of the Physics Department of the School of Engineering of the Air Force Institute of Technology for the background on EMP they have given me. A special thanks is due to Mr. Marvin Squires of the Applied Sciences Division at White Sands Missile Range for his cooperation in providing me information on EMP simulation and testing.

EMP: AN INCREASINGLY IMPORTANT NUCLEAR WEAPONS EFFECT

by Captain Jay C. Willis

INTRODUCTION

EMP stands for electromagnetic pulse and, as the name implies, is a short-duration pulse. An effect associated with the detonation of a nuclear weapon, EMP has the capability of damaging some electronic and electrical equipment.

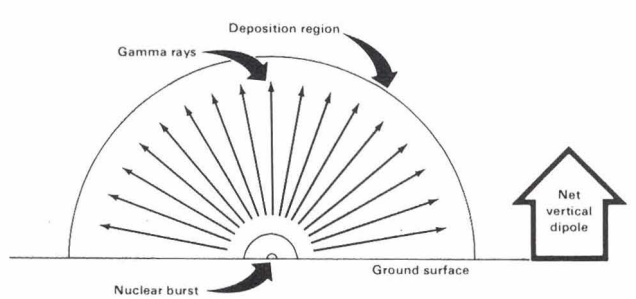
Like the more familiar "blackout" effect which can disrupt the transmission of radio and radar signals, EMP is caused by the ionization of a volume of air by gamma rays. However, unlike the passive effects of blackout, EMP effects include the active production of electric and magnetic fields. These fields of submillisecond duration may contain sufficient energy to damage electronic or electrical equipment at distances where the traditional nuclear effects of blast, heat, and radiation are comparably insignificant.

Nuclear weapons effects testing conducted by the United States in the 1940s and 1950s centered on those three prompt effects. The presence of an electromagnetic pulse was expected, since even conventional explosions were known to generate such signals, but EMP was of little concern from a military view. Electronic systems in use at the time were inherently resistant to EMP. Typical burst conditions limited the range and magnitude of the radiated fields. During that testing some electronic component failures were observed, and later analyses indicated that EMP had played a role in those malfunctions.

By 1960 it was realized that various military and civilian electrical and electronic systems were possibly vulnerable to EMP and that the conversion to transistor circuitry was probably increasing those vulnerabilities. Several shots of the Dominic series of nuclear tests in the Pacific in 1962 were primarily planned to yield data on EMP. Since the end of atmospheric nuclear testing in November 1962, we've increased our knowledge of EMP and its effects by reevaluating the old data in light of new theories, by conducting nonnuclear simulations, and by performing numerous theoretical analyses.

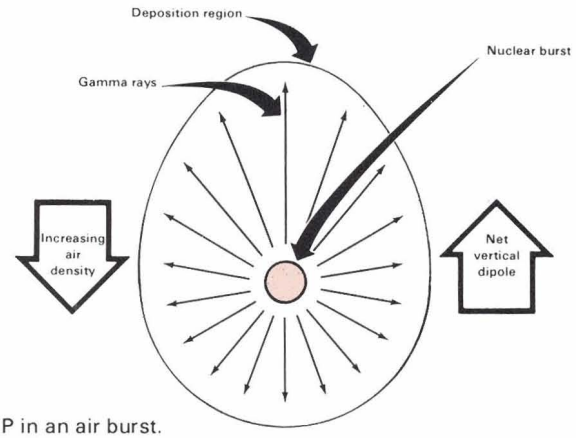
TECHNICAL DESCRIPTION

EMP is generated immediately after a nuclear detonation. Gamma rays produced by the weapon ionize the air surrounding it. Simply stated, electrons are driven from the air atom nuclei radially outward from the weapon. This separation of charge gives rise to strong electromagnetic fields within the region of air absorbing the gamma rays. Due to asymmetries that appear, as described below, some of the energy of these fields is radiated to greater ranges.



EMP in a surface burst.

The strongest fields are observed within the deposition region (a pancake-shaped volume of atmosphere below the burst). A field of 1- to 6-kilometer radius (depending on the yield) will result from a near-surface burst having a height of burst from 0 to 2 kilometers. In this region, although the electric field may well exceed 100 kilovolts per meter, the effects of blast and radiation will generally predominate on all but hardened military systems. Since the presence of the ground plane causes a strong asymmetry in the deposition region, an electromagnetic field will be radiated beyond the extent of atmospheric ionization. These field strengths will drop off rapidly with increasing distance from the burst. A rough estimate of the electric field strength 5 kilometers from a 1-kiloton surface burst would be 4 kilovolts per meter.



EMP in an air burst.

An air burst (height of burst 2 to 20 kilometers) typically represents less of an EMP threat to ground equipment than either a surface burst or an exoatmospheric detonation. Although the field strengths within the deposition region (5- to 15-kilometer radius) will be rather large, the fields transmitted outside the region will be comparatively weak. The main source of asymmetry is the change of air density with altitude. Although this causes a net vertical dipole, it is much less pronounced than with a surface burst. Since little of the available electromagnetic energy is radiated beyond the deposition region, the air burst is usually not considered a significant EMP threat.

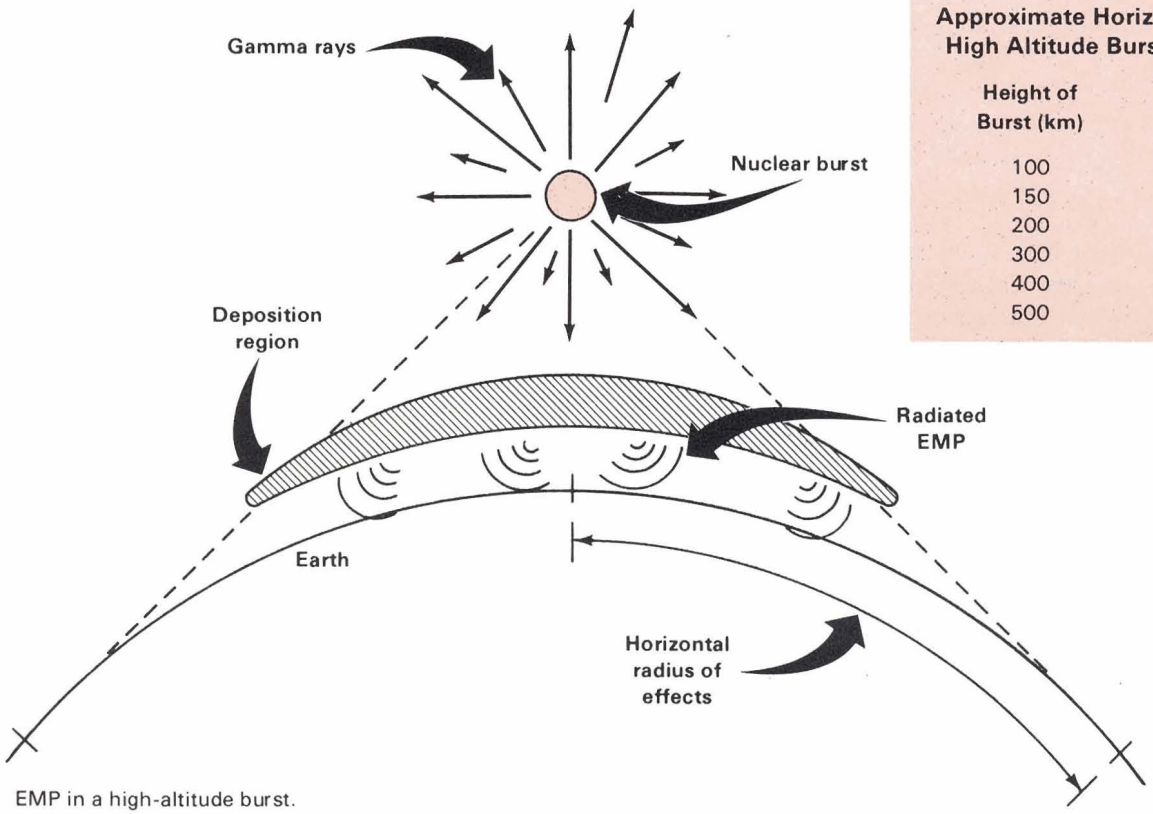
Very high altitude bursts (40 kilometers or higher), while presenting negligible threat in terms of the other nuclear weapons effects, may represent a serious EMP threat to friendly military and civilian electrical and electronic equipment.

The ionized region extends approximately from an altitude of 10 to 80 kilometers, and its horizontal extent is strongly dependent upon the height of burst (Table 1).

Table 1.

Approximate Horizontal Radius of High Altitude Burst EMP Effects

Height of Burst (km)	Radius (km)
100	1100
150	1400
200	1600
300	1900
400	2200
500	2500



EMP in a high-altitude burst.

As with bursts at lower altitudes, the electromagnetic fields within the deposition region are sizable. Unlike the air burst case, the fields radiated from this region to the ground can also be very strong. The fields observed will generally depend upon the burst yield, altitude and geographic latitude, position of the observer, and various atmospheric conditions. The fields incident at ground level will be fairly uniform over most of the areas given in Table 1. The average peak electric field magnitudes will vary with several factors, but may be between 10 and 50 kilovolts per meter. This value is exceeded (outside a deposition region) only in the case of a near-miss surface burst.

COMPONENT VULNERABILITY

EMP field magnitudes are extremely high compared to those encountered on the battlefield resulting from the operation of radios, radars, and other electronic equipment. But the vulnerability of any system to EMP is determined by the energy collected by a critical component rather than by the field strengths. Collection of EMP energy is conceptually the same as collection of radio energy: a collector (antenna) is exposed to the fields and the energy it collects is channeled (and usually filtered in some manner) to components that respond to that energy. The primary practical differences between EMP and radio reception are that the EMP energy collector may not be an antenna and the energy collected may be sufficient to cause damage to a wide variety of components. Whether a component of the system suffers damage depends upon the amount (and character) of energy delivered to it and its vulnerability to that energy.

The amount collected by any system depends upon the efficiency of its collector. A collector of electromagnetic energy from the EMP would include not only those items specifically designed to be antennas but also cables, gun tubes, missiles, openings in metal inclosures, structural members, guy wires, conductor loops, railroad tracks, fences, metal sheets, and a variety of otherwise innocent appearing items.

There is a wide difference in the susceptibility threshold levels between the various electrical and electronic components. Nonelectrical equipment and personnel are inherently very hard to EMP effects. Damage will occur to such equipment (or a person will be injured) only if there is contact with a large collector. Items such as motors and power switches (i.e., components that are subject to substantial power levels in normal use) are relatively immune to EMP unless a large collector injects a strong energy surge into them. On the other hand, modern electronic components that operate at very low power levels may be quite easily damaged. Table 2 shows the relative susceptibility of several electronic and electrical components to EMP effects.

Two types of EMP-induced damage may occur. The first, known as catastrophic failure, is permanent. It is irreversible and would require replacement of the affected component. Examples of this type of failure include melting of conductors and destruction of semiconductor junctions. The second type, known as functional upset, is temporary. Recovery of full use of the device may take from less than a second to several minutes. Examples of functional upset would be the tripping of power overload circuit breakers and the volatile memory elements of a digital computer (the "flip-flop" elements) flipping out of position. Although no permanent damage would have occurred, this type of upset can be serious for a system depending upon continuous operation for its effectiveness.

Table 2.

Relative Susceptibility to EMP of Selected Components

(Listing from most to least susceptible in terms of typical damage threshold energy)

- Digital computer volatile memory circuits (functional upset)
- Microwave semiconductor diodes
- Integrated circuits
- Field-effect transistor
- Radiofrequency transistors
- Low-power, silicon-controlled rectifiers
- Audio transistors
- Medium/high-power rectifier semiconductor diodes
- Composition and wire-wound resistors
- Vacuum tubes
- Low-current switches, relays, and meters
- Detonators, pyrotechnical devices, and rocket fuels
- Motors and transformers

SYSTEM VULNERABILITY

Even given a system containing electronic components of known susceptibilities and EMP threat level, the determination of whether the system as a whole is vulnerable is difficult to make.

The best indication of a system's susceptibility (short of an actual atmospheric nuclear test) is its reaction to a full-scale, nonnuclear EMP simulation. Using specially designed electronic equipment, it is possible to create electromagnetic

fields, similar in many respects to EMP, over ground areas sufficiently large to test some entire systems in their operational configuration (e.g., a tank, airplane, or self-contained air defense fire unit).

The susceptibility of any system (to include information such as the type of EMP threat to which it is vulnerable, how often EMP-induced outages may occur, what components would be affected, and the specific steps one can take to either prevent or remedy damage) is often not available to equipment operators. A discussion here of system vulnerabilities must therefore be in general terms.

Based upon component susceptibility, it is possible to rank system types according to their vulnerability to EMP effects. Some simple rules aid one to rank a system's vulnerability. First, any digital computer is susceptible to functional upset. Second, the more advanced the circuitry (the more low-power transistors and integrated semiconductor circuits have been used), the more susceptible the equipment is compared to similar equipment using older circuitry (medium-power transistors or vacuum tubes). Third, the more powerful a signal the equipment is designed to receive, the less susceptible it will be. And fourth, equipment having large collectors will be more likely to be damaged than similar equipment having smaller collectors. Of course, these rules cannot account for system peculiarities (including intentional design hardening) which can affect system hardness and which can usually be identified only by a thorough analysis or testing.

Testing of air defense equipment for EMP susceptibility has been less than regular. Some equipment is tested and design hardened from the early engineering phases. Other equipment is either not tested at all, or the EMP effect is not seriously considered in its design. The Hawk and Nike Hercules systems were apparently tested to a small degree over a decade ago when both systems claimed an EMP hardness due to vacuum tube and power transistor circuitry. Since then, both systems have evolved dramatically, particularly through the latest improvement programs which involve conversion to more integrated circuitry and digital technology. However, no further testing has been conducted; therefore, the vulnerability of these systems is currently an unknown. The new AN/TSQ-73 fire control system, possibly vulnerable because of its advanced circuitry and digital computers, has not been tested either. Both Chaparral and Vulcan have been tested, but neither system had EMP considered to any extent in its design. The tactical radio systems used by air defense units have generally been tested. The Safeguard antiballistic missile system had extensive design hardening, but little or no EMP simulation testing was performed on the operational hardware. On the other hand, the Patriot system (SAM-D) has incorporated design hardening and some degree of testing in EMP simulators throughout its recent development.

In designing protective measures, two general tactics are used. The first is to limit the amount of energy delivered to the critical components. This would include reducing the size of collectors or installing metal shielding, surge arrestors (clamping devices), or filters. It would also include any alteration of circuit wiring (including the elimination of metal wiring in favor of optical fibers) or system configuration, or any change in operating procedures to eliminate specific vulnerabilities. The second tactic is to simply avoid the use of sensitive components.

The clearest unclassified case of EMP effects resulting from an actual nuclear blast occurred in 1962. The Starfish Prime shot of the Dominic series of nuclear tests on 7 September 1962 had a yield of 1.4 megatons and a height burst of 400 kilometers. The detonation took place over Johnson Island, about 800 miles from the Hawaiian island of Oahu. A number of civilian electrical system failures were reported there. The failures included blown fuses on strings of street lights, opened circuit breakers on power lines, and activation of "hundreds" of burglar alarms. The damage suffered was little more than a nuisance; however, the affected items were relatively hard to EMP effects. The electronic components in common use today are more advanced and more susceptible to EMP than their 1962 counterparts.

CONCLUSION

It is clear that advances in electronic circuitry used in air defense systems should make EMP an effect of increasing importance to both engineers and operators. The air defense officer even now should have a feeling for what effects of EMP he would have to contend with on the nuclear battlefield and what he can do to protect his equipment from those effects.

The operator can do little to harden his equipment to EMP, but a few things might help. Foremost, the equipment should be operated and maintained as specified in appropriate technical manuals, since any deviation may degrade designed protective measures. Equipment access doors should be kept shut and cables should be buried under a sheet steel and earth cover when

possible. Use the shortest possible cables and disconnect them when they are not in use. Equipment should not be placed near any large collector such as long cables, fencing, or railroads.

Because classification of vulnerability analyses precludes discussion of a specific system's response to EMP or even the likelihood of response, little may be offered here as an example of what an air defense officer may expect to see in terms of EMP damage. Probably most damage will have to be detected and repaired (if catastrophic failure) as would any other component malfunction. Digital computers, being among the most susceptible devices, will probably be affected the most often. In the case of volatile memory upset, the remedy will be to reload or reprogram the computer. (Note that magnetic tape or other semipermanent storage devices used to store data or programs for the computer are very hard to EMP effects.)

One question that is easy to answer is whether any given air defense system may reasonably expect to be subjected to an EMP in a nuclear war. A single thermonuclear detonation at an altitude of a few hundred kilometers can blanket an entire theater of war with a strong EMP. EMP could damage any of our military or critical civilian electrical systems or electronic equipment. Any potential nuclear adversary probably would not hesitate to make full use of EMP against our forces.

CAPTAIN JAY C. WILLIS *graduated from the United States Military Academy in 1973. He served with Battery A, 6th Battalion, 56th Air Defense Artillery (C/V), in Germany and later attended the Air Force Institute of Technology at Wright-Patterson Air Force Base, Ohio. After a 2-year course in nuclear weapons effects, he was awarded a master of science in nuclear engineering.*

SHORAD vs AIR CAV (Everybody Wins)

by 1LT Thomas C. Rogan and 1LT Martin W. Shubert

The crews of short-range air defense (SHORAD) weapons can reap tremendous benefits from a knowledge of enemy air tactics. By having some idea of what tactics enemy pilots are likely to use, air defenders gain a valuable tactical advantage. Unfortunately, few of our soldiers seem to have this knowledge.

Field exercises frequently incorporate "enemy" aircraft, allowing SHORAD crews to practice detecting, tracking, and indentifying targets. But it is a common occurrence in such exercises, when air defense tactics are not the primary concern, for pilots to behave as if no air defense were present. Hence, SHORAD and aircraft crewmen lose the sense of urgency needed to get the most out of their participation, and experience our SHORAD crewmen could have gained is lost.

FM 44-1 states: "It is probable that the first attacks of the next war will be from the air and that the first targets of these attacks will include ADA units as a high priority. To achieve air superiority, the enemy must destroy our air defense weapons early in the battle, and these weapons will be positioned around assets already high on his list of targets." Yet very little emphasis is placed on educating crewmembers or their leaders in what tactics to expect from these pilots as they approach the defended asset. And inadequate attention is given to the protection of air defense weapons themselves from air attack.

However, and happily, exceptions to this sort of uncoordinated, underplayed SHORAD training have occurred recently at Fort Bliss in exercises that pitted elements of the Air Cavalry Troop, 3d Armored Cavalry Regiment (ACR), against crews of the 1st Battalion (C/V), 55th Air Defense Artillery. In one case, the Air Cavalry's OH-

58C Kiowa scout helicopters and AH-1S Cobra assault helicopters deployed against Chaparral and Vulcan emplacements as part of the latter's squad level ARTEP evaluations. In another instance, the helicopters flew against this same unit during a battalion field exercise. The increasing use of helicopters on the modern battlefield is a fact, and the likelihood our SHORAD crews will encounter these aircraft in the initial engagements of any future war is consequently greater. (Although the tactics employed by the Air Cavalry Troop may not exactly duplicate what an actual enemy might use, there is inevitably enough similarity for this practice to be profitable to our air defense crewmen.) Interviews with pilots who flew against the positions of the 1st Battalion, 55th ADA, have yielded insights and information of great value to planners of short-range air defense.

Aeroscouts fly nap-of-the-earth and can quickly drop out of sight.

The scout helicopters always precede the assault helicopters into a hostile area. Pilots fly nap-of-the-earth, at speeds ranging from 5 to 30 knots, as they approach their objective. They land and disembark, preferably below a ridgeline, to observe in detail each expanse of open terrain they will cover. Concealed at vantage points and aided by high-power binoculars, the scouts easily discern any positions that are silhouetted against the sky or insufficiently camouflaged. They then call in artillery fire or the assault helicopters to engage their targets. The aeroscouts prefer to call artillery fire, if available, rather than

Chaparral is difficult to camouflage, but it can be done. A low profile is essential.

needlessly risk losing a gunship in an engagement with an air defense weapon.

A common rationalization among SHORAD crewmen for not camouflaging their positions as well as they might is that they need only be well enough hidden to deceive high-speed, airborne observers. Knowing that they are as likely to be detected by enemy observers on the ground should generate more concern for cover and concealment. Emplacement in hull defilade (which also adds protection from artillery fire) and other means of concealment are as important to the forward area air defender as to any other combat soldier. Our crews must be made to understand that the time and effort spent improving their positions are not wasted. What can be seen can be killed and, with weapons of great range and capability at his disposal, the enemy can destroy us without warning.

During the two exercises mentioned, many Chaparral, Vulcan, and forward area alerting radar (FAAR) crewmen became casualties without ever having seen their enemy because he saw them first. In contrast, one Chaparral squad, which was especially well camouflaged, scored six kills against the helicopters in a single battle and was never spotted, despite the scouts' having knowledge of its general location. When successfully concealed, positions could not be detected at ranges beyond several hundred meters, even in the sparse vegetation of the desert. Scout pilots consider their normal acquisition range for SHORAD weapon positions to be 1,500 meters.

The signature of a Chaparral missile (with its present motor) is obvious, and this could negate even the best efforts at concealment of one's position. FM 44-1 recommends changing position whenever a missile has been fired and also suggests that squads move every 4 to 6 hours as a minimum to avoid detection by enemy reconnaissance. Whatever the reason for movement, commanders should carefully consider the relative dangers involved before establishing policies or issuing directives strictly in accordance with the manual. The 3d ACR pilots noted that track vehicles moving across open terrain, especially dry and dusty areas, are extremely easy to detect from a distance. If it is thought that a Chaparral's position has not been pinpointed within the short time necessary for the missile's smoke trail to dissipate, remaining stationary is probably the best option. The same is true for Vulcan, which has even less signature. Additionally, making a move simply because a weapon has been in position for a certain amount of time and may have been spotted is a questionable tactic. The judgment of pilots who have flown against Chaparral and Vulcan positions in the field is that their survivability would be better served by camouflaging thoroughly and avoiding unnecessary movement.

A second weakness of the air defenders that the pilots were able to exploit was the predictability of their locations relative to the FAARs and to the other air defense weapons emplaced around an asset. Pilots quickly learned that the presence of a FAAR, nearly impossible to camouflage well in the desert, was a reliable indication that a SHORAD platoon would be found from 2 to 8 kilometers to the rear. And once one Chaparral or Vulcan had been sighted, the others positioned around the asset could be easily located.

When engaging enemy air defense, the OH-58 pilots attempt first to destroy any radars and thus deny the defenders early warning. When the FAARs are positioned nearer the FEBA than the weapons are, they are particularly vulnerable. Without protection, the life expectancy of a FAAR in the forward area is so short that its value is negligible.

FM 44-3 suggests that, for forward area weapons, "radar coverage should extend beyond the fire unit position at least 10 kilometers." This doctrine can be adhered to without unnecessarily endangering the FAAR and its crew by deploying the radar 1 to 5 kilometers to the rear of the most forward fire unit. While still providing sufficient early warning, this would probably cause scout aircraft to come within range of the fire unit's weapons before spotting the FAAR which, because of its high profile, is easily visible from as far away as 5 kilometers.

Untempered adherence to the employment guidelines of mutual support and balanced defense is especially dangerous with SHORAD weapons. The symmetrical pattern of positions that results from strictly doctrinal employment not only betrays the presence of an asset that might be otherwise well concealed, but also makes each weapon position that much easier for enemy scouts to locate. When planning the defense of an asset, commanders would do best to consider terrain and the most likely avenues of approach for aircraft flying nap-of-the-earth rather than the field manual's general guidelines. The air cavalry pilots suffered the most confusion and the greatest losses when forced to expose themselves in the search for weapons that were "not where they were supposed to be."

The well-concealed air defender gets a clear shot at his unsuspecting foe.

More realistic exercises of the nature described above are clearly called for. Command level coordination of the play promotes realism, which benefits all levels and both sides. Pilots and air defenders stand to gain by realistically testing themselves and their

tactics in the field, and the trend toward increased cooperation between the two branches should be encouraged. After-action critique and analysis meetings, with representatives from both sides present, help make the most of the joint training. Leaders who participate in these sessions should be sure to pass the lessons and information gleaned from them along to their troops. Too often the soldiers at squad level, whose individual knowledge, ability, and motivation determine the Army's total capability, are denied the information they need to do their jobs as well as they might. Perhaps even more direct forms of communication could be tried, such as classroom instruction for air defenders by pilots, and vice versa. But whatever form future cooperative efforts take, they are bound to be to everyone's advantage.

LIEUTENANT ROGAN *is a graduate of the University of Wisconsin at Madison. He received his commission in 1979 and was assigned to the 1st Battalion, 55th ADA, after graduating from the ADA Officer Basic Course. He is currently attached to the US Army Air Defense Board at Fort Bliss, Texas.*

LIEUTENANT SHUBERT *graduated from the United States Military Academy and subsequently attended the ADA Officer Basic Course. He was honor graduate of the Improved Hawk Course and also graduated from flight school in October 1980. He is presently serving as a scout section leader in the Air Cavalry Troop, 3d Armored Cavalry Regiment, Fort Bliss, Texas.*

SURVEY RESULTS

Soldiers Applaud TEC Lessons

Practically all soldiers, at one time or another, have been exposed to the US Army Training Extension Course (TEC) program. TEC lessons consist of self-paced instructional material in various forms: printed text, audio tapes, and audiovisual tapes. Recently, the TEC program was the subject of a worldwide opinion survey. This article presents the results of that survey:

Usefulness—99 percent of the respondents felt that TEC was useful. Of this group, 84 percent believed TEC to be very useful.

Frequency of Use—47 percent of Active Army respondents said TEC lessons were used daily, 41 percent said they were used at least once a week, and only 12 percent said that TEC was used once a month or less.

Of the Reserve Components replying, 80 percent indicated that TEC was used every drill period. Sixteen percent said TEC was used once every fourth drill period.

Of all replies, 77 percent indicated their units used TEC during duty and off-duty hours. The remaining 23 percent said TEC was used only during duty hours.

Group Usage—According to survey totals, TEC lessons are used most frequently by small groups of 10 soldiers or less. Only 30 percent said TEC was used primarily by individual soldiers, and 11 percent said TEC lessons were used mostly by groups of more than 10 persons.

Lesson Format and Quantity—97 percent indicated a preference for audiovisual lessons as opposed to print text or audio-only lessons. At present, roughly 60 percent of all TEC lessons in the field are of the audiovisual format.

Command Emphasis—40 percent of all commenting units replied that TEC is considered required training. A slightly higher percentage, 45 percent said that TEC lessons are voluntary. Fifteen percent said the lessons are both required and voluntary.

TEC Equipment and Equipment Repairs—the survey disclosed that although 80 percent of all units have learning centers, only 71 percent felt they had enough equipment. Further, only 63 percent of the units felt they had enough space, and only 61 percent believed they had enough materials to train their soldiers.

A few complaints were directed at the lessons, calling them dull, boring, slow, or repetitious. The survey showed, however, most soldiers believe TEC lessons are instrumental in improving their SQT scores.

AMERICA'S COMMITMENT TO FREEDOM

by Colonel Floyd James Thompson

Editor's Note: *This article won COL Thompson the Freedom Foundation George Washington Honor Medal in 1980. Thompson was held prisoner of war in Vietnam for 9 years — longer than any other American in history. He is retired and currently resides in Alexandria, VA.*

America had a total commitment to freedom during WW II. Commitment to freedom during the Vietnam War was virtually nonexistent. Vietnam veterans frequently hear this taunt from veterans of World War II: "We won OUR war," with the obvious implication. The following is my reply.

"Your" war? I was an 8-year-old third grader when your war started but nobody told me that it was your war. I always thought it was our war. It was our war because all Americans, regardless of age, race, sex, color, creed, or political orientation went all out to support the war effort. Differences were shelved for the duration and, in keeping with our noble heritage, Americans stood up as one in defense of freedom.

President Roosevelt called on us to plant victory gardens to grow our own vegetables; the tin went to the war effort, not into tin cans. I raised rabbits to reduce our need for meat. My classmates and I did odd jobs to earn money to buy stamps and pasted them into a book until we had enough to buy a war bond. We had a contest in school to see who could earn the most bonds. We bought knitting needles, girls and boys alike, and brought them to school along with scraps of wool. We forewent recess to devote our time to knitting 6-inch squares that our teacher put together to make an afghan to send to a hospital for wounded soldiers. Because wool was scarce, we ripped up our old woolen clothes to use. Our teacher taught us how to raise tomato plants from seeds so we could have our own plants to set out when planting season started. Our class volunteered to devote additional time after school to improve our writing skills so we could write to our soldiers to help their morale. We wrote to relatives and friends in service and, to insure no soldier was left out, we became pen pals with service members who did not have families.

When the supply of aluminum to build planes became short, our mothers answered the president's call by marching to city hall with their aluminum pots and pans and, as the high school band played "The Stars and Stripes Forever" and "God Bless America" and with the mayor giving a rousing patriotic speech, the country's need for aluminum was met. We could cook in anything; our boys needed planes.

Meatless Monday became a way of life as did wheatless Wednesday. We had little gasoline so vacations were out of the question. We walked so that you could ride. Women worked so that men could fight. Older men who couldn't fight worked long hours to produce guns for you. We grieved as we hung gold stars in the window.

And when the last battle was over and the war was won, you came home to a hero's welcome. Bands played, ticker tape was showered upon you, men cheered, children shouted, women wept; you received the tribute you so richly deserved from a grateful nation. You came home to the greatest outpouring of gratitude, love, and affection in history. You were our heroes; nothing was too good for you.

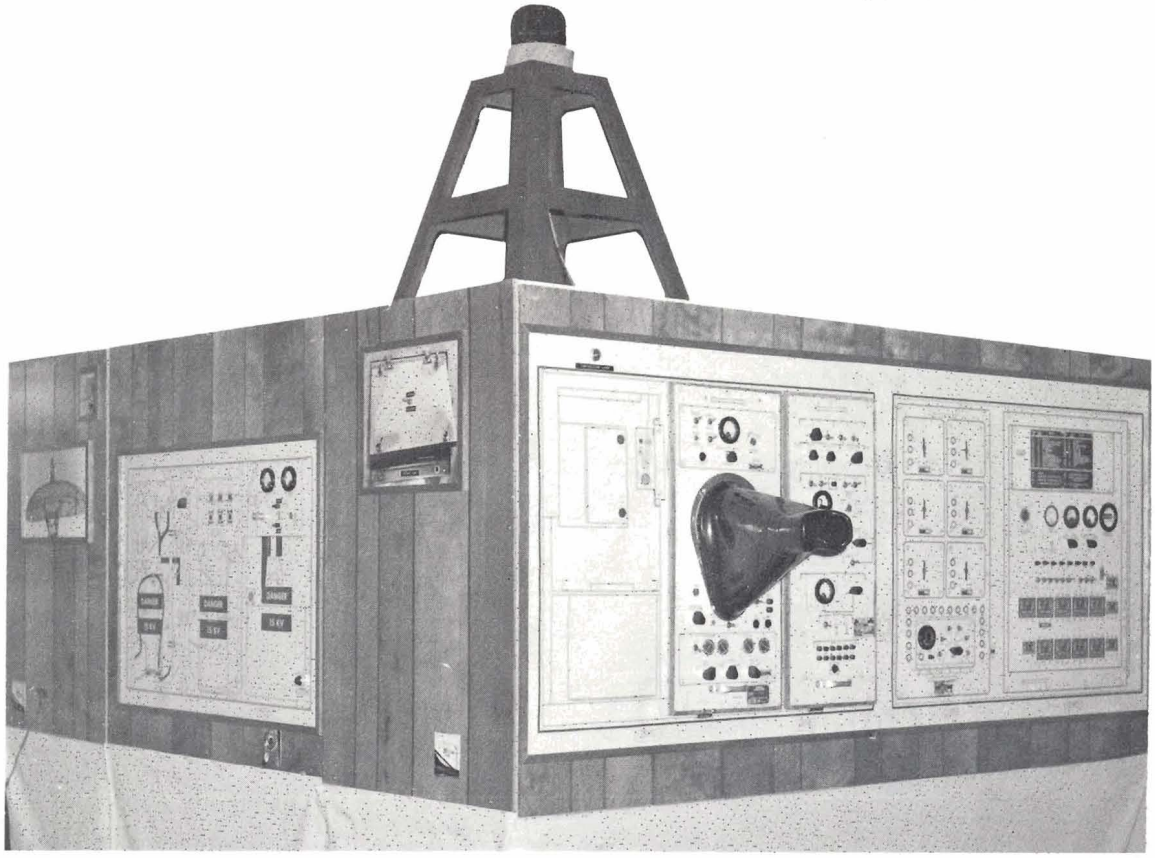
So you see, World War II was every American's war. Those who were too old to fight and those who were too young to fight gave it their all on the home front so that you could give your all on the battlefield.

And that is what I mean when I say, "I always thought World War II was 'OUR' war." We, as a nation, were totally committed to freedom.

When you say, "Vietnam was 'my war'," I must concede that you are right. And may God have mercy on all of us.

PAR FLAT PANEL SYSTEM SIMULATOR

by Linda Pirino Ross



Most Americans have heard the expression "it's the real thing." It implies that imitation just isn't as good. Well, that may be true for things like soft drinks, dairy products, or precious gems, but not in the Hawk training program. At the US Army Air Defense School (USAADS), Fort Bliss, Texas, it was discovered that imitation, or simulation, may be every bit as good as the real thing, as far as training is concerned, and it costs a lot less.

BACKGROUND

In 1980, an initial test of the continuous wave acquisition radar (CWAR) flat panel system simulator resulted in proof that the simulator was a relatively inexpensive, effective training device that provided a skill transfer to the real CWAR of nearly 100 percent. These results gave officials of USAADS the encouragement needed to explore the possibility of using simulation in another area of training — in particular, pulse acquisition radar (PAR) operation.

PAR training was plagued by the same training problems as those encountered in CWAR training: too many trainees for the amount of equipment to accommodate them. So representatives of the US Army Air Defense Board (USARADBD) and the Directorate of Training Developments (DTD) met to discuss the construction of a PAR simulator that would be cost effective and would meet the needs of the Air Defense School. With assistance from the Electrical/Mechanical Branch of the USARADBD and from the Training and Audio-visual Support Center, DTD directed the design and fabrication of a prototype PAR flat panel system simulator (FPSS). In April 1981 it was completed and ready for testing.

DESCRIPTION

The prototype PAR simulator looked a bit different from the CWAR simulator. It was a single, four-sided unit as opposed to the two flat panels that made up the CWAR FPSS. Each side of the PAR simulator had line drawings of equipment panels that corresponded exactly to the four sides of the actual radar. Controls and indicators specified in the energizing and daily checks procedures were active mechanically and electrically. The

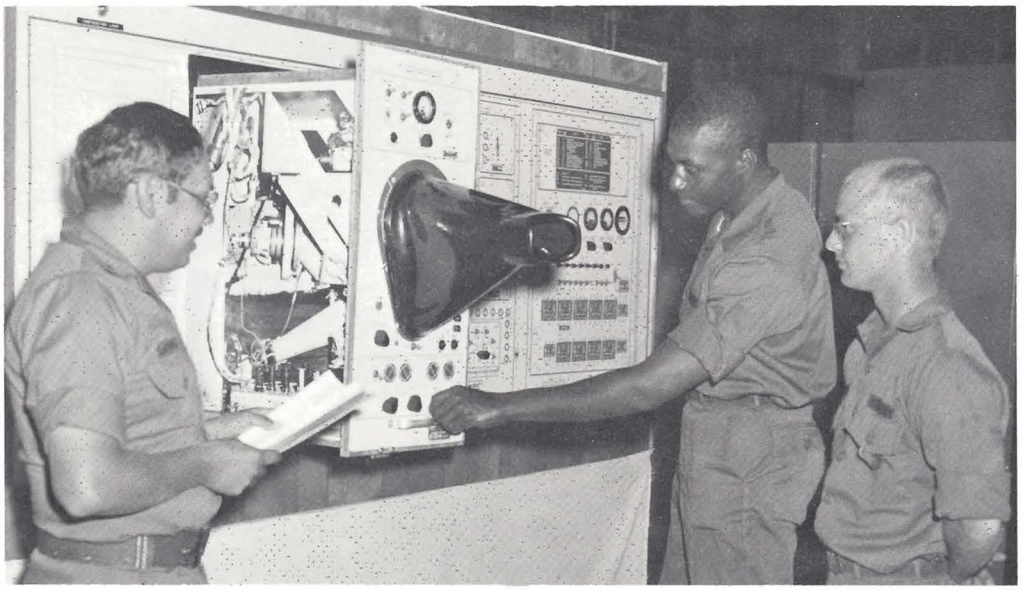
simulator also had fault switches — a feature not found on the real equipment. Twelve faults could be switched in to give various abnormal indications. The capability also existed to add an additional 12 faults. Pullout units and video presentations on the PPI and A-scope provided additional realism. A revolving light on top of the FPSS simulated antenna rotation.

Like the CWAR simulator, the prototype PAR FPSS was constructed of plywood and hardboard and operated on 120v, 60-Hz power. Initial figures showed the cost of the simulator to be about $14,000.

VALIDATION

Prior to the actual validation, an evaluation was conducted by the USARADBD to insure that the PAR FPSS model accurately simulated actual PAR control panel functions. Then two groups of advanced individual training (AIT) students (a control group and a test group) were chosen for the validation process. Both groups learned the operator checks and adjustments as specified in TM 9-1430-1534-12-1. Nine performance tasks were required:

- Procedures prior to application of power.
- Position of controls prior to application of power.
- Energize PAR shutdown to standby.
- Energize standby to radiate.
- Daily energizing checks.
- Daily receiver standby checks.
- Daily transmitter checks.



Pvts Edric G. Lewis and Kevin R. Smith train on the PAR FPSS while the training instructor, SGT Zenon Cardenas, checks their performance.

Pvt Lewis takes his examination on the actual radar and SGT Cardenas evaluates him.

- Daily radar performance checks.
- Deenergize PAR.

Each student received about four class periods of introduction to the Hawk missile system and the PAR. The use of technical manuals, how to read meter scales, and general course requirements were also covered during these introductory classes. Twenty periods of hands-on instruction followed. The control group (composed of 10 students) completed all training on the actual radar, while the test group (composed of 20 students) trained only on the PAR simulator. No attempt was made to alter the instructional methods or the standard USAADS course outline for Hawk students.

After 2 weeks of training, the moment of truth arrived when both groups were given end-of-course examinations on the PAR. The test group students were introduced to the real radar equipment for the first time to determine the degree of their skill transfer.

The examination results were positive. The test group students successfully accomplished all training objectives on the actual radar with efficiency and without hesitation. In fact, their performance scores and average times to complete the examination were remarkably similar to those of the control group. The PAR-trained students completed their examination in an average of 31.7 minutes. The average completion time for the FPSS-trained students was 31.1 minutes. The success rate for both groups was 100 percent.

Another significant finding of the validation testing concerned the identification of faults. Various false indicator readings were inserted into the simulator to evaluate the test group students' ability to identify abnormal readings. The students did so with remarkable success. They correctly identified 97.2 percent of all the faults tested. This additional training was not possible for the control group because false indications cannot be entered into the actual equipment.

The resulting validation data proved that the PAR FPSS provided sufficient hands-on training to enable students to transfer simulator-acquired skills to the actual radar.

OBSERVATIONS

How did the students and instructors react to the PAR simulator? Most of the students thought the simulator was helpful, especially in learning the location of controls. Comments such as this were common: "The noise level at the FPSS training site was not as high as at the actual PAR so we were able to concentrate on what we were doing."

The instructors were unanimous in the opinion that the FPSS was dependable and required little maintenance. They further commented that the simulator resembled the PAR sufficiently to teach course objectives, was easy to set up and to train with, and could be used to evaluate several performance tasks.

The instructors and the students all agreed that the PAR simulator was an effective training tool and should be used in the Hawk AIT programs.

CONCLUSION

As a result of the findings of the validation testing, plans are underway to construct eight additional PAR FPSSs.

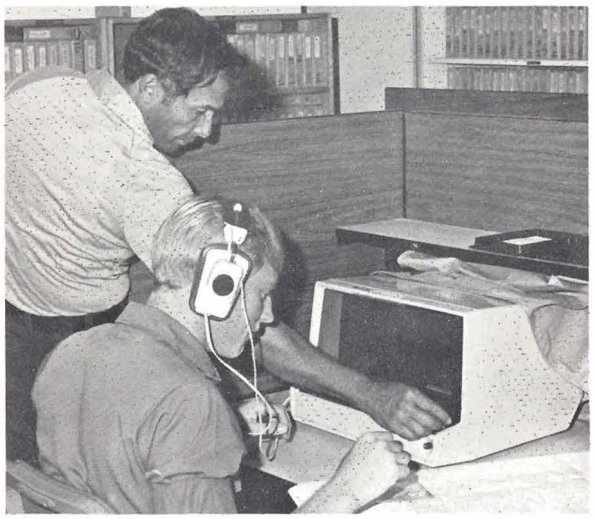
The most obvious advantage to the government in using the simulators is cost effectiveness. To provide the same training as the nine FPSSs, nine PARs would be required at a cost of more than $5 million. The cost of the simulators will be about $126,000. Another important plus is the fact that students who train on the simulators are successful in transferring their skills to the PAR; thus we have well-trained graduates entering the field at a decidedly lower training cost.

From the trainee's point of view there are other important advantages. Use of the PAR FPSS increases the hands-on training time available to Hawk AIT students. Each trainee can work on the simulator until he feels confident that he can operate the actual equipment. And he can be at ease while learning because the simulator cannot be damaged by improper operation, which is not the case with the actual radar. In addition, the simulator does not present any safety hazards to the student.

Expectation is that the PAR FPSS will be as successful as the CWAR FPSS. Four CWAR simulators are now being used for training, and since their incorporation into the Hawk training program in the summer of 1980, the degree of skill transfer for each student has averaged 95 percent.

Devices such as the PAR and CWAR FPSSs definitely give the Army the most in training efficiency for every training dollar invested.

LINDA ROSS *completed her internship as a technical publications writer intern in February and joined the AIR DEFENSE Magazine Staff as assistant editor. A former lieutenant in the Army, she graduated summa cum laude from Marywood College in Scranton, Pennsylvania.*



Mr. Jacinto Vasquez assists a student with map reading on the Beseler Cue/See. Shelves in the background are lined with some of the Training Extension Course tapes on hand at the center.

11th ADA Brigade Learning Center

by Beverly M. Ulmer

Two soldiers from the 11th ADA Brigade take advantage of learning center facilities during their lunch break.

In a past issue of AIR DEFENSE Magazine, a challenge was issued to learning centers with the question being asked, "Can your learning center match this one in quality?" The 11th ADA Brigade commander answered, "Yes. Not only can we match that learning center but we can surpass it and issue a challenge of our own."

In August 1980, the commander changed the management of the brigade learning centers. Instead of units maintaining their own, one learning center was placed under operation of the education center. In coordination with the education center, a brigade education/learning center was developed to provide qualified counselors and contract personnel to insure full Army Continuing Education Program support. The center was placed in a strategic location that would provide easy access to the battalions within the brigade.

The soldier's exposure to the education/learning center occurs when he inprocesses. At that time, he is briefed on all aspects of the center and how it can aid in his development as a soldier. Since the center acts as a control point, all Training Extension Courses (TEC) are available for all MOSs within the brigade. Along with the TEC materials are an adequate number of Beseler Cue/See machines, 16-mm projectors, audio tapes and tape players, printed lesson materials, and other learning devices. The equipment and materials are for group or individual use. Individuals use the materials on a drop-in basis, whereas groups are scheduled to use the three classroom-size facilities or the larger classroom that can accommodate up to 100 soldiers. Approximately 250 soldiers a month frequent the learning center on an individual basis, and those in groups number approximately 1,500 per month.

Mr. Jacinto Vasquez, learning center operator, has set up three programs that are assisting individuals who want a structured 40-hour course in 16E (Hawk Fire Control Crewmember), 16D (Hawk Missile Crewmember), or in the common subjects. This arrangement is being well received by the many individuals within the brigade who use it during lunch hours, after working hours, or during any free time. The soldier reviews the TEC materials and then takes a test on the subject. If 80 percent or higher is scored

on the test, the soldier then goes to the next tape. Once the program is completed, a certificate of training is awarded. This type of learning is excellent in preparing for an SQT or a promotion and is done at the soldier's own pace. If a soldier chooses to study other MOS lessons, he may branch out to any area of interest. This is also true in choosing correspondence courses.

Correspondence courses (Army and Air Force), general education development (GED) tapes, college-level political science tapes, electronics study materials, apprenticeship programs, and tapes in both the German and Spanish languages are available. Assistance is there for the asking in any expressed area of interest. This service is provided from 0730-2100 Monday through Thursday and 0730-1600 on Fridays. The afternoon hours will find soldiers working with a tutor on basic literacy skills or military subjects.

A learning center operator/tutor is present to help students who are interested in improving their math and English skills. The soldier may be preparing to take the GED test or need a good review before he embarks on a college-level course. Tutoring is done informally and is always on a one-to-one basis. It also allows the soldier to update his MOS skills and knowledge when he has the time. This and other services are synonymous with the learning center.

Learning center services are provided to instructor personnel to locate available training resources from the Index of Army Motion Pictures and Related Audiovisual Aids, the Index of Training Publications, availability lists, and other military publications. The center provides equipment and lessons to units when training is conducted outside the learning center, such as the unit area or the field. Due to the amount of time that 11th ADA Brigade personnel spend training at Tobin Wells, a learning center has been situated close to that training area for added convenience.

Mrs. Emma Davis, counselor in the Army Continuing Education Program, supervises a soldier who is enrolled in the NCO Development Course.

The education/learning center has been a part of the NCO Development Course since its inception. Briefings are given to each class to familiarize the soldiers with more than 1,700 learning aids that are conveniently located for their use. They become aware that it is the place to come when they are to conduct classes on military subjects. Letters of administrative instruction act as lesson plans and can be invaluable in preparing for a class. The first step is to let Mr. Vasquez know what type of class one is responsible for and the wheels start turning. The education/learning center personnel do their utmost to provide guidance in almost any area.

The quality of the education/learning center lies not only in the equipment and materials available but in the personnel and their sincere desire to aid the soldier in his capacity as a soldier and as an individual. The brigade commander's interest in his soldiers and in providing them the best is continuous. If you are at Fort Bliss (or later come to Fort Bliss) and you want to visit the 11th ADA Brigade education/learning center, you will find it in building 2903.

The challenge has been met. Now we extend the challenge to others as we continue our efforts to excel.

BEVERLY ULMER *is an Education Services Specialist and has been with the Fort Bliss Education Center for 4 years. Ms. Ulmer received a BS in Education from the University of Texas at El Paso and an MA from Webster College. In April 1981, she presented a paper on Management of Education/Learning Centers at the National American Personnel and Guidance Association Conference in St. Louis, Missouri.*

COMMUNICATIONS IN THE ADA BATTALION

by Captain Richard S. Hepworth

TIME: 14:20:00 — An enemy pilot eases the joystick forward on his supersonic fighter bomber. The needle-nosed jet swoops low to the ground and thunders through the valleys of Germany at 450 miles an hour. The pilot gently moves the joystick back and forth, guiding his powerful warplane effortlessly over the rolling countryside. The plane is 4 minutes from the target, the division ammunition supply point (ASP) 30 miles away.

TIME: 14:20:32 — The MiG is now 26 miles from the target. The blip that was the aircraft has disappeared from the scope of the powerful American Hawk radar. The plane is too low. It can be stopped now only by the division's short-range air defense (SHORAD) deployed through the division area.

TIME: 14:20:56 — A forward area alerting radar (FAAR) has just finished setting up and is now broadcasting early warning information to SHORAD units defending the division ASP. The MiG is now 23 miles from the target and closing. The enemy is invisible for the moment, but the FAAR position allows it to provide early warning to a nearby Hawk fire unit.

SP4 John Morgan, a Redeye gunner, is helping defend the ASP. He must orient his target alert data display set (TADDS) so that his relative position to the FAAR is known. The TADDS has a grid of 49 squares. Each square represents 5 square kilometers. In each square, a red disk appears if unknown aircraft are detected. The FAAR is always in the center of the display. Morgan must know the FAAR's position and his own position to orient himself to the data box. If he has done his job, he will know if he is sharing a 5-kilometer square with an unknown plane. Without knowing the location of the FAAR, the early warning information it provides is worthless. Morgan turns on his radio to get the latest position of the FAAR that supports him.

TIME: 14:21:36 — "Zulu Four Echo Three One, Zulu Four Echo Three One, this is Zulu Four Echo Seven Seven, over."

TIME: 14:21:44 — The MiG fighter bomber has covered 1 mile since Specialist Morgan started talking. The aircraft is hugging the ground at 300 feet, traveling a mile every 8 seconds. The big, fire-breathing, jet engine is providing enough thrust to lift the plane over

power lines and low hills at the last second, keeping the plane low—out of the "eyes" of the Hawk radar.

TIME: 14:21:45 — "Zulu Four Echo Seven Seven, this is Zulu Four Echo Three One, over."

TIME: 14:21:50 — "Zulu Four Echo Three One, this is Zulu Four Echo Seven Seven. What is your position? Over."

TIME: 14:22:00 — "Zulu Four Echo Seven Seven, this is Zulu Four Echo Three One. Authenticate Alpha Tango, over."

TIME: 14:22:08 — "Zulu Four Echo Three One, this is Echo Seven Seven. Roger, wait. Out."

TIME: 14:22:10 — The MiG is less than 15 miles from the target. Friendly elements have less than 2 minutes to detect, identify, and destroy the intruder.

TIME: 14:22:16 — "Echo Three One, this is Echo Seven Seven. I authenticate, Whiskey."

TIME: 14:22:19 — "Echo Seven Seven, this is Echo Three One. Roger. I have encrypted message for you, over."

TIME: 14:22:24 — "Roger, Echo Three One, over."

TIME: 14:22:28 — "Echo Seven Seven, this is Echo Three One. Message follows: 'I set Papa Tango . . . .'"

TIME: 14:22:32 — Farm animals grazing in a pasture bolt and run for cover when they are startled by a giant warplane screaming over their heads faster than 600 feet per second. The pilot is 11 miles from the target—less than 90 seconds before the first bomb will be released.

TIME: 14:23:00 — "Roger, Echo Three One. Echo Seven Seven, out."

TIME: 14:23:05 — SP4 Morgan begins to decode the grid location sent by Echo Three One. Morgan writes the clear text number on his hand because his note pad is wet.

TIME: 14:23:15 — The enemy pilot's heart begins to pound with excitement. He is only 5 miles from the target and still has not been detected.

TIME: 14:23:20 — The FAAR spots the MiG and instantly broadcasts the early warning to anyone with a properly emplaced TADDS box tuned to the proper address code.

TIME: 14:23:23 — A red disk flashes on the lower right hand corner of Morgan's TADDS box.

TIME: 14:23:30 — With a sickening awareness, Morgan knows the disk representing an unknown is in his area of responsibility.

TIME: 14:23:32 — A flash of color catches Morgan's eye. He drops the TADDS box and fumbles for his Redeye launcher.

TIME: 14:23:34 — The enemy plane thunders over him, so close he could throw rocks at it.

TIME: 14:23:35 — Morgan assumes a firing position, but in his excitement he cannot release the safety catch.

TIME: 14:23:36 — The fighter is gone. Morgan listens to the howl of the powerful engine as the plane darts away. The pilot is 3 miles from the target. He fingers a red toggle switch on the control panel. A red warning light flashes on: "WEAPONS ARMED."

TIME: 14:24:00 — There is a terrific flash of light as the division ASP explodes in a ferocious orange flame. Thirty-two soldiers are killed.

The moral of this story is that voice radio transmissions are too slow for the modern battlefield. Although commanders will fight to keep it as a method of command emphasis and control, the days of voice radio communications may be numbered. The Army must reevaluate its concept of tactical battlefield communications. Weapons have become ever more sophisticated, while tactical communications systems have remained static. The problem, as

illustrated in the example of the air strike, is that the Army's capabilities and responsibilities have expanded so greatly that in a tactical situation there is an almost constant flood of voice traffic necessary to manage the force. Soldiers with tactical experience can attest to the ever present problem of someone else horning in on their frequency. The reason is that a division operates two or three times as many radio nets as there are frequencies assigned. Someone else will nearly always be on your frequency. My example of the air strike on the division ASP was designed to show that even though radio waves move at the speed of light, the enemy can outrun our tactical communications systems. But we can whip him anyway, because the communications shop at the battalion level can become a force multiplier. Communications is the key to the battle and it is time to start thinking of "commo" as a weapon. Communications systems in today's Army are not just for command and control. They will kill the enemy. The technology I will describe is available and is being fielded. Those of us who will be in the Army to see the realities of Divison 86 need to start thinking now about the application of microprocessing equipment and high-speed tactical data transmissions. Let us briefly recreate the scenario of the air attack on the division ASP. But this time, we will show the proper application of communications combat power.

TIME: 14:20:58 — SP4 Morgan hears a short beep on his digital message device. The beep indicates that he has received a message from some station in the net and his device has sent a response acknowledging that the message has been received.

TIME: 14:21:00 — SP4 Morgan opens the flap covering the digital message device (DMD) viewing screen. This message is displayed:

FROM: Z4E31

TARGET TRACK #1

Speed - 450 mph

Target Azimuth - 110

Time to Engage - 90 seconds

The message was composed and transmitted in less than 2 seconds. However, a lot happened in that time. The microprocessor at the FAAR made contact with the Hawk radar microprocessor. Hawk told FAAR of any targets that may be of a tactical interest to it. Hawk reported the loss of a hostile radar track, just before the FAAR came on line. Hawk knew the speed and direction of the target before it lost contact and computed its straight line course. This computation indicated the target will appear on the FAAR radar in 80 seconds. The FAAR computed the straight line course and compared this to the known positions of the defending weapons. The FAAR extrapolated that the plane will pass directly over SP4 Morgan's position 10 seconds after the FAAR acquired the target on its own radar. An early warning message was sent to Morgan. The MiG covered half a mile between the time the FAAR broadcast its first data message and a complete early warning message was received by Morgan, the gunner in a position to do something about it. The MiG has 22.5 miles to go to the target—19 miles until it crossed SP4 Morgan's defensive positon.

TIME: 14:22:10 — The MiG is less than 15 miles from the target—less than 12 miles from the Redeye engagement zone. The pilot is exuberant. He steers the plane slightly to his right, deciding at the last minute to take advantage of a low ring of hills to mask him from any FAAR that may be operating.

TIME: 14:22:15 — SP4 Morgan calmly selects his firing position, reading the azimuth of 110 from the DMD. The FAAR has computed this angle knowing the position of SP4 Morgan and the projected course of the MiG.

TIME: 14:22:45 — SP4 Morgan's teammate, PFC Bullock, scans the DMD screen for any update on the tactical situation. If and when there is a change, he will relay it to Morgan, who is waiting impatiently with his weapon ready.

TIME: 14:23:15 — The enemy pilot's heart begins to pound with excitement. He is only 5 miles from the target and still undetected.

TIME: 14:23:20 — The FAAR sees the intruder and identifies it as unknown. There has been a course change from the predicted position projected by the Hawk radar. A new tactical message for SP4 Morgan's Redeye team is composed and transmitted.

TIME: 14:23:21 — PFC Bullock's DMD gives an audible beep. Bullock reads the message:

FROM: Z4E31

TARGET TRACK #1

Speed - 450 mph

Target Azimuth - 90

Time to Engage - 8 seconds

TIME: 14:23:22 — Bullock shouts to Morgan, "Left a little!" Morgan turns slightly to his left

and takes a deep breath.

TIME: 14:23:24 — The DMD beeps again. The display reads only two things:

NOW: Target Azimuth - 90

READY - 5 seconds

The last line is flashing on and off.

TIME: 14:23:25 — SP4 Morgan pushes the safety and actuator device forward and down. The Redeye is armed.

TIME: 14:23:28 — The DMD beeps. Bullock recognizes the MiG crossing and shouts, "Fire." Morgan quickly continues the firing sequence and pulls the trigger. He watches in awe as the missile slices into the sky.

TIME: 14:23:31 — Time seems to move in slow motion as the MiG crests the top of a small stand of pines to Morgan's front. The Redeye follows the MiG.

TIME: 14:23:32 — The pilot sees the missile closing on him and instinctively turns away from it.

TIME: 14:23:33 — There is a blinding flash of light. The pilot feels an instant of surprise. It is the last sensation he will ever know.

During the second scenario, notice that no voice traffic is passed over the radio. All communications are between computers and microprocessors. High-speed data bursts are used to send vast quantities of information in seconds. The man-machine interface at the DMD shows free text as well as tactical messages on a light emitting diode (LED) display board. The message goes into memory so it can be recalled if necessary.

The DMD is not only useful for finding out what the machines are talking about, but also for communications between people where many stations share the same frequency.

The operator selects the station he wants. Then he pushes a microswitch on the LED display board marked "Free Text." The top half of the screen appears as a series of broken lines. The bottom half appears as the alphabet. The operator pushes the letter he wants and a microprocessor places the letter on top of the first broken line. As he pushes more letters, his message appears.

EXAMPLE: MSG TEXT:

N E E D _ A M M O

_ C A N Y O U _ H E L P ?

A B C D E F G H I

J K L M N O P Q R S

T U V W X Y Z . ?

1 2 3 4 5 6 7 8 9

RECALL XMIT

ON OFF

When the operator pushes the "XMIT" button, a high-speed data stream sends the message and receives an acknowledgement so fast that the blower fan on a 524 radio cannot even run up to full speed before the message has been sent and acknowledgement received.

Tactical communications will be responsible for the revolution in warfare and tactics that is necessary for our Army to fight outnumbered and win. A new Navy destroyer takes advantage of its firepower by tying all its sensors, radar, and sonar into a fire direction center where targets and weapons are matched for the greatest probability of successful engagement. The advantages of a destroyer, as opposed to a division, are that its size is compact and its sensors and computers are tied together by wire and are firmly bolted to the deck. A division has no such luxury. Hundreds of microprocessors scattered throughout the battlefield will coordinate targets, ammunition, available weapons, firing times, and patterns.

Communications assets must tie these sensors, weapons, and people together. Millions of bits of data will flow across the battlefield every minute. Proper management and application will insure that the force multiplier effect of communications is optimized. Its applications are limited only by imagination. We must begin now to put more emphasis on communications as an integral part of weapon systems. The proper application of communications combat power will be a decisive factor on the next battlefield.

CAPTAIN HEPWORTH *is commander of the 258th Signal Company, Fort Gordon, Georgia. He is a graduate of the University of Utah (with a BS in telecommunication management) and of the Signal Officer Advanced Course. He has served as commmunications officer with an air defense artillery battalion in Germany and participated in the SHORAD C^2 Communications Trials in Buddingen.*

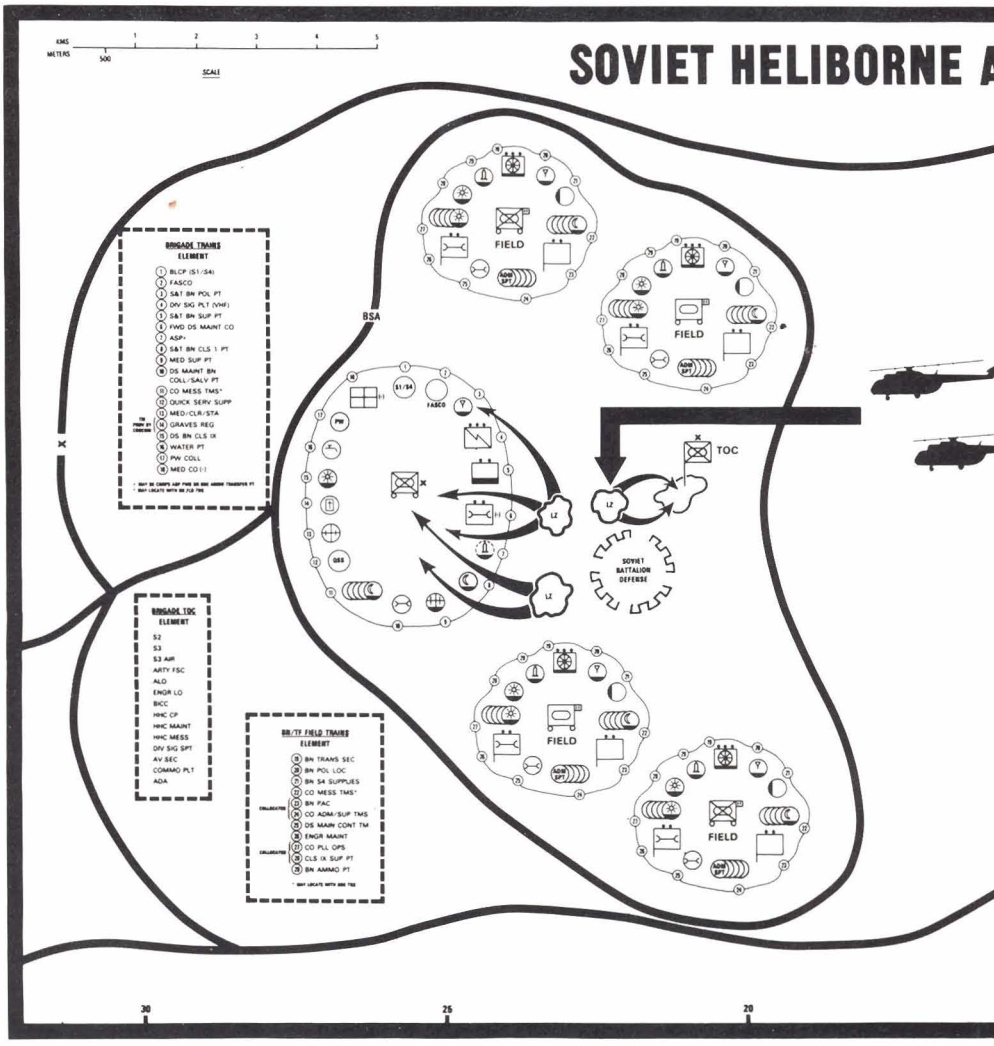
SOVIET MOTORIZED RI
HELIBORNE ASSAULT

b

The following is a scenario of a heliborne assault by a Soviet motorized rifle battalion against a US Army brigade tactical operations center (TOC) and brigade trains. This assault is conducted in coordination with an attack by first echelon elements of three regiments of a Soviet division against four deployed battalions. The assault operation is accomplished within 3 hours, after which the assault forces occupy a previously designated battalion defense area to await a linkup with leading elements of the three regiments. Soviet doctrine does not provide for resupply of assault forces. In this case, linkup must occur within 4 to 6 hours following initiation of the operation. If the linkup fails, the Soviets simply consider the assault battalion expendable.

Heliborne assaults are planned at army level. The Soviet army commander, tactical air army commander, and division commander work together to plan such operations. In the situation portrayed in the schematic, the Soviet army commander determined that the terrain and tactical situation require one brigade to locate its TOC and trains within a few kilometers of the other. This led to the selection of this brigade as the target of the heliborne operation. The assault mission is to (a) destroy brigade command and control assets of the TOC; (b) destroy the brigade trains, particularly critical supplies (e.g., ammunition and POL); and (c) deliver a swift, adverse psychological blow to the brigade. The purpose of the ground attack against the four battalions is to break through or bypass those battalions and linkup with heliborne assault forces for subsequent operations against other units in the US division. The Soviet army headquarters, in close coordination with the air army, planned the joint operation. Such planning includes allocation of HIP helicopters for the air assault and control of Soviet air defense systems along the flight corridor. The point of entrance of the helicopters may be over the brigade or an adjoining sector as a diversion.

A motorized rifle battalion is the heliborne assault force. It is provided by the army's second echelon division because the division in contact cannot afford a battalion from its second echelon regiment. The selected battalion has previously undergone heliborne training. In this scenario, the battalion was stripped of its heavy weapons and equipment. Available lift precludes bringing in heavy equipment such as armored personnel carriers and trucks. In addition, the 120-mm mortar battery has been stripped from the battalion. The battalion's firepower is reinforced with portable systems. Weapons include: 27 RPG-7 rocket launchers, 8 manpack AT-



4/SPIGOT antitank guided missiles (ATGM), 4 SPG-9 73-mm recoilless guns, individual assault rifles, and crew-served light machineguns.

Plans called for 17 helicopters to airlift the battalion, its weapons and a UAZ-69 (jeep) to the assault objective area.

Although the Soviets prefer that an assault objective be within artillery range, 10 to 15 kilometers from the forward edge of the battle area (FEBA), it does not exclude assault at greater depths. In this portrayal, the heliborne assault is approximately 25 kilometers from the FEBA. Radio communications can be maintained with the main forces as the battalion has both FM and AM radios. Suppression of opposition in the assault objective area is conducted with the weapons described in paragraph 3 above and helicopter armament (e.g., ATGMs, 57-mm rockets, and machineguns). Individual weapons may be fired by troops from brackets affixed to HIP helicopter windows. The transports spend as little time as possible at the landing zone, departing the moment assault troops dismount.

In this scenario, helicopters fly in a loose formation of four, using contour flight cover en route. The return route normally is along a different flight path.

Following are highlights of the joint operation:

During the heliborne operation, helicopter and assault commanders were in the same helicopter, well forward in the formation, to insure effective coordination, including radio contact with ground operations in the main battle area.

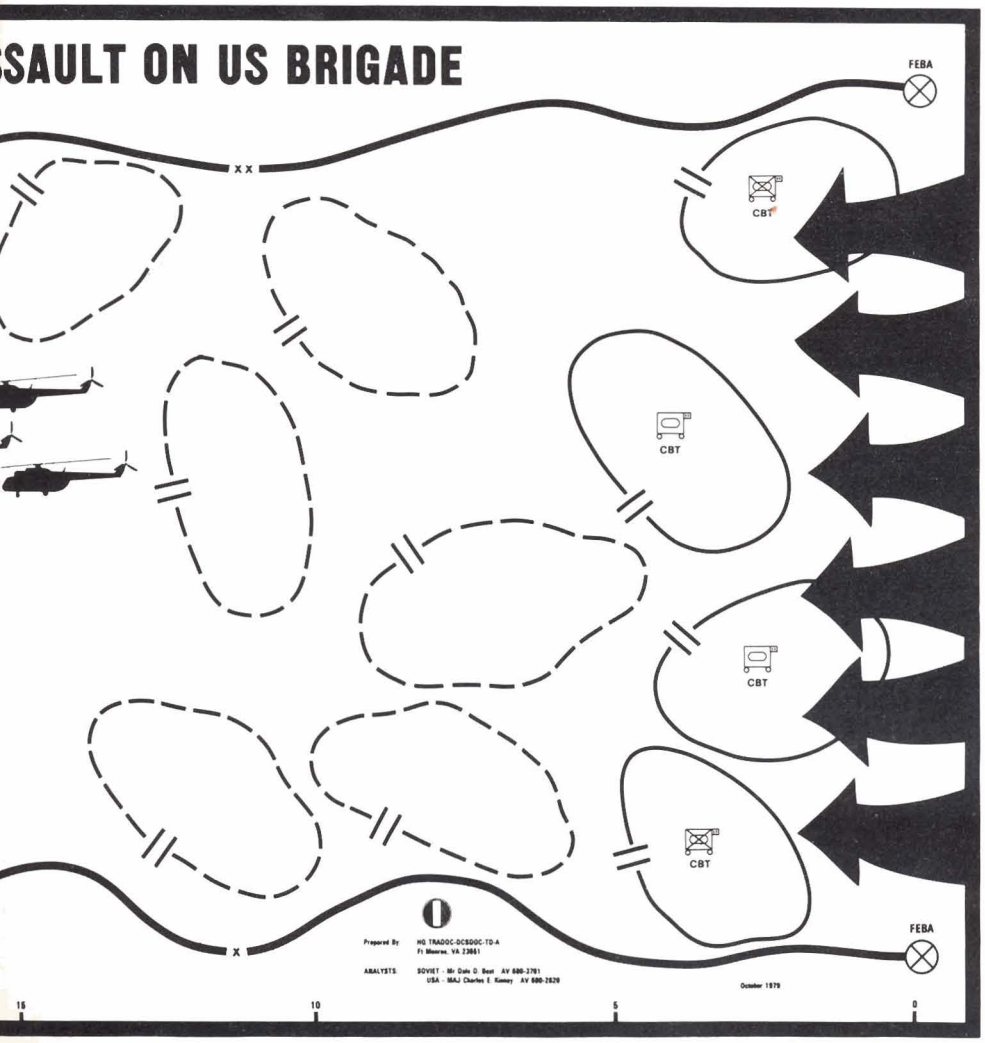
As depicted in the drawing, three landing zones were used, one for each of the three companies. The attack against the TOC was made in company strength. The attack against the brigade trains was conducted by two companies and mounted simultaneously from different directions.

After three companies secured the objectives, within the prescribed time of 3 hours, they deployed for the conduct of a perimeter defense to await linkup with the leading elements of the attacking Soviet division. Hasty company and platoon strongpoints were established on available high ground to provide interlocking fires for direct support weapons to cover all likely approach routes.

When advancing ground troops approached the defense position, communications were established and prescribed linkup procedures and recognition signals were implemented. After linkup, the assault force withdrew and reverted to control of its parent army second echelon division.

FLE BATTALION

Dale D. Best



DALE BEST *is the Chief of General Intelligence Branch, TRADOC Threat Directorate. An analyst on Soviet operational strategic doctrine and organization, he has prepared numerous ministudies such as this and the one on Soviet Motorized Rifle Battalion in the Defense, which was published in the Jan-Mar 81 issue of AD Magazine.*

SCOPE AND NATURE OF THE ADA OFFICER BASIC COURSE

by First Lieutenant Robert H. Sellman III

One of the greatest services that can be rendered the newly assigned second lieutenant is to provide his commander with a view of the training this officer has received prior to arrival at his unit or office. This information enables the commander to plan more efficiently in further training the new lieutenant. It also provides for a more accurate base from which to assess the abilities of that young officer, which is beneficial to both the new officer and the commander. With these things in mind, it seems essential that something be done to provide information on the training that is currently included in the Air Defense Artillery (ADA) Officer Basic Course.

The purpose of the Officer Basic Course (OBC) is to prepare the newly commissioned officer for that first duty assignment. OBC is the first, and certainly one of the most important, professional development courses an officer will attend. The course is the responsibility of the Tactics Department of the US Army Air Defense School and consists of a complementary mix of conference, self-paced and hands-on instruction, as well as seminars and practical exercises to reinforce instruction. Approximately 500 new ADA officers attended this course in the past fiscal year. Included were Active Army, Army Reserve, National Guard, and Allied officers. Actual instruction is conducted by the two academic divisions: Command and Management, and Tactics and Doctrine.

The Command and Management Division is responsible for those subjects that are administrative in nature. The division is divided into four branches: Leadership, Management, Logistics Management, and General Subjects.

The Leadership Branch presents 35 hours of instruction on current leadership philosophies and techniques. Subjects presented include ethics, discipline, human and group behavior, drug abuse, and organizational effectiveness. This branch trains the young officer to maximize his leadership ability and exposes him to some of the

Student officers learn to set up a perimeter defense for a battery. This is one of the many phases of tactical training conducted during the Officer Basic Course.

current problems he will encounter as well as some of the techniques he can use in coping with these problems. This is accomplished through lecture and conference classes and extensive use of seminars with officers and NCOs currently serving in batteries.

Thirty-six hours of extensive, detailed instruction on the battalion training management system, military justice, and officer and enlisted personnel management are the responsibilty of the Management Branch. This information is essential to the new officer and provides the knowledge he needs to perform administrative duties efficiently.

The Logistics Management Branch provides 50 hours of comprehensive instruction. Subjects presented include The Army Maintenance Management System (TAMMS), prescribed load list (PLL), materiel and unit readiness reporting, dining facility management, and supply procedures. Specific instruction is also presented on supply adjustment procedures and preparation of reports of survey. Logistics management instruction on TAMMS, PLL, and materiel and unit readiness reporting is culminated by a 16-hour practical exercise (PE). During this PE the student is required to perform functions characteristic of battery-level maintenance procedures. In the case of an M151A1 ¼-ton truck, for example, before operation the lieutenant must:

- Perform operator checks.
- Record missing parts (TAMMS clerk function).
- Check for on-hand stockage.
- Order parts (PLL clerk function).
- Maintain a unit PLL file.
- Inventory basic issue items pertaining to the M151A1.
- Prepare a DA Form 2406 (Materiel Readiness Report) and a DA Form 2715 (Unit Status Report).

This exercise encompasses the functions of the operator, TAMMS clerk, PLL clerk, wheeled vehicle mechanic, motor sergeant, and motor officer at the battery level. The instruction allows the young lieutenant to acquire and practice the knowledge that will enable him to manage the efficient, effective maintenance program that is essential to air defense units world wide.

Thirty hours of instruction are presented by the General Subjects Branch. This branch provides instruction in the rules of land warfare: survival, escape, resistance and evasion, preventive medicine, field sanitation, and the code of conduct. This instruction assists in preparing the young officer for a field environment. In addition, the Communicative Arts Program is the responsibility of this branch. The program enables the lieutenant to assess his communications skills, provides instruction on briefings and military writing techniques, and provides a forum for upgrading these skills.

Rounding out the instruction provided by the Command and Management Division are 10 hours of land navigation instruction. Through the use of diagnostic testing and classroom and field training, the program insures that ADA second lieutenants are well on the road to mastery of a subject that is critical in a tactical environment.

The Tactics and Doctrine Division (TDD) provides the instruction that enables lieutenants to function as air defenders. TDD is divided into two academic branches: How to Fight (HTF) and Command and Control (C^2). It is here that the new second lieutenant learns how to provide air defense protection for the ground-gaining arms and to fight and win the air battle. This knowledge of tactics and doctrine allows the platoon leader to maximize the capabilities and potential of his specific weapon system and to integrate that weapon into the total air battle.

The HTF Branch is subdivided into three sections: Combined Arms, High-to-Medium-Altitude Air Defense (HIMAD), and Short-Range Air Defense (SHORAD). They account for 62 hours of comprehensive, tactically oriented instruction. Eighty percent of this instruction is oriented towards how air defenders may best support the ground-gaining arms as an integral member of the combined arms team. Twenty percent of the instruction is combined arms specific, providing instruction on the tactics and doctrine employed by armor, infantry, and field artillery units, as well as the capabilities of engineer and other support units. Instruction presented includes: basic considerations of combat, combat battalion organization and tactics, field artillery observed fire procedures, and organization of Army divisions. These classes provide essential knowledge for the new officer, giving him insight into how he may most successfully support the ground-gaining arms.

The HIMAD section presents instruction pertaining to the tactical employment of the Hawk and Nike Hercules weapon systems. Only through a complete and thorough knowledge of how to properly employ our assets can we defeat the Threat. Threat doctrine calls for a high intensity air battle. We must train our junior leaders to use what they have to the maximum extent possible to win. Instruction in this area stresses proper employment of weapon systems including discussion of the fundamentals of air defense: reconnaissance, selection, and occupation of position.

The defense of the division is of critical importance, for only the ground-gaining arms are able

to close with and destroy the enemy. This instruction is the responsibility of the SHORAD section. Emphasis here is on defeating the low-altitude threat, both the attack helicopter and high-speed, fixed-wing aircraft, to avoid suppression of the maneuver battalions. Subjects include Soviet aircraft identification and capabilities, Chaparral/Vulcan employment, Redeye/Stinger principles and planning, and small arms for air defense.

The HTF Branch reinforces its instruction with various exercises, most notably the Air Defense Fire Direction Center Exercise. This exercise allows the student to apply the tactics in a stressful environment.

The C^2 Branch further teaches the new lieutenant to fight on the modern battlefield where we must be able to shoot, move, and communicate to survive. In the C^2 Branch the lieutenant learns how to communicate and survive in a nuclear, biological, and chemical (NBC) environment.

The Communications Section presents 23 hours of instruction. The subjects included are radiotelephone operator procedures, communications-electronic counter-countermeasures, tactical communications equipment, communications-electronics SOP, communications-electronics operation instructions, communications security, and codes.

The Threat currently has the capability to launch high-intensity chemical and nuclear attacks. A priority target for those attacks will be air defense sites. The platoon leader must be prepared to train his soldiers to fight successfully in an NBC environment. The NBC Section provides 31 hours of instruction and has the mission of preparing our junior officers to do just that. Subjects presented include the Soviet NBC threat; NBC training and organization; chemical agents, chemical and biological defense; aspects of nuclear warfare radiation detection, indication, and computation instruments; chemical detectors; and introduction to NBC decontamination. The NBC Section also presents protective mask confidence and decontamination exercises that provide for student practice during the classroom instruction.

The culmination of TDD instruction takes place in the perimeter defense field training exercise. During this operation, the instruction previously received is integrated to provide a real-world tactical situation.

An intensive effort is also made to keep the students abreast of current innovations in air defense. This is accomplished by the guest speaker program and by classes that familiarize the lieutenants with the equipment used in the Air Defense Artillery Branch. Well-informed officers result from this effort.

Throughout the course, students are also exposed to the soldierization program conducted by the student battalion commander. Soldierization is that process by which an individual's behavior becomes consistent with the standards, values, and attitudes of the Army. The program is structured and performance oriented and is a continuing activity. This activity equips the lieutenant to make a greater contribution to the quality of his new unit.

After graduation the branch-qualified officer attends 5 to 10 weeks of weapon instruction. Highly technical instruction is provided on the weapon system to which the young officer will be assigned.

The future for the school, as well as the branch, is extremely bright. Ongoing efforts are being made to evaluate and upgrade the instruction presented here. Branch training teams are constantly in the field soliciting comments from field units pertaining to what is needed to upgrade the quality and expertise of the newly arrived lieutenant. Information is provided the young officer in the development of new weapon systems as it becomes available. As the new systems are fielded, instruction will be revised to include them.

The result of this intensive effort is a highly trained second lieutenant capable of functioning within a unit and with a background that will facilitate further training. It is still, and always will be, the responsibility of commanders to insure that their subordinate leaders are properly trained. Experience can never be duplicated in the classroom. What we try to do here at the school is provide a basis for further training and to impart the basic knowledge of tactical principles that will enable the young officer to learn, grow, and mature.

LIEUTENANT SELLMAN *is currently serving as an instructor in the Command and Management Division of the Tactics Department, US Army Air Defense School. A 1979 graduate of Providence College in Providence Rhode Island, he is working toward a master of arts degree from Webster College. He previously served as the Redeye section leader, 1st Battalion, 23d Infantry (Tomahawks), 2d Infantry Division, Camp Hovey, Korea.*

AIR DEFENSE IN THE AIRLAND BATTLE

PART TWO: CONTINGENCY AREAS

by Major General John B. Oblinger, Jr.

My article, "Air Defense in the Airland Battle," which appeared in the July-September issue of AIR DEFENSE Magazine, introduced the meaning of airland battle and its implications for air defense artillery (ADA). As you will recall, the objectives of airland battle are to create opportunities for our fighting forces to seize the initiative, thwart the enemy's plans, and bring the battle to a quick conclusion on our terms. To accomplish these objectives, the battlefield and the battle are extended in distance, time, and the type of assets commanders use to fight. The need for "seeing and attacking" deep is the key to success in the airland battle. ADA supports commanders at all echelons, helping them to deny the enemy the objectives he seeks, to prevent enemy forces from massing for the close-in fight, and to find and create the opportunity to seize the initiative.

This article focuses on how ADA supports the corps commander as he fights the airland battle in a contingency operation outside established theaters. This has been referred to in literature as the "other war" for which our forces must prepare. Any such contingency operation will pose some extremely unique problems to the planners and the force commander.

Throughout the history of modern warfare, the commander has actually been concerned with three separate wars: *deployment, employment, and sustainment.* Defeat in any one war has meant failure to accomplish the mission and defeat of the force as a whole. Let me expand on this concept.

First, there is the war of *deployment*, during which the commander must protect and conserve his combat power while he introduces his forces to or reinforces those in a theater of operation. In the NATO theater we enjoy the benefits of a large established force, as well as large quantities of prepositioned equipment and supplies, thus allowing the commander to generate a much larger force rapidly by introducing only the required manpower and light equipment into the theater. By way of contrast, in a contingency environment, we will probably have neither the prepositioned equipment nor the standing force available and in position to protect a lodgment. Indeed, we may be required to seize a lodgment by force. Consequently, any deployment to a contingency area will require the most meticulous planning for sequencing the introduction of our force. Headquarters elements and combat units must mature together in the theater. This requires the introduction of slices of combat headquarters elements with the combat forces at each level. During this phase, the security of the lodgment area is of paramount importance. Further compounding the problem is the possible lack of significant host nation support.

As the force grows, and even during the deployment phase, the war of *employment* begins with the tactical dispersement of some forces beyond

the lodgment area. The war of employment in a contingency area also has many differences from that of a NATO-like theater. In the NATO arena, we have long-established operating procedures for the integration of US forces with our allied partners. In a contingency area, many of these procedures will need to be developed as required, with necessity being the driving force. Further complicating this will be new and unfamiliar terrain, greater uncertainty of the threat, potential extremes of climatic conditions, and far more extensive distances than are normally addressed in our doctrine.

In addition to all of these factors, an even more significant problem will be sustaining the force. During both the war of deployment and the war of employment, the single most difficult task may be the provisioning of the logistical support required to maintain combat power. It is in this context that the war of *sustainment* takes place, providing us our greatest challenge. Unlike the European environments where we have established an extensive theater support network for the introduction and distribution of personnel, equipment, and supplies, a contingency environment requires us to start almost from scratch. Life-supporting and war-fighting supplies must be introduced as we introduce the force itself. The absence of established sea, air, or land lines of communications further exacerbates this problem. The anticipated long distances to the theater, as well as within the theater, will place great burdens on both our strategic and tactical transportation. Consequently, in all areas, we must be prepared to do much more with less. This indeed is a challenge to planners and commanders at all levels. The great uncertainties involved will require not only thorough planning but also perfect execution if we are to realize our goal of providing the requisite air defense protection to our armed forces worldwide in support of our national objectives.

Let's now discuss how ADA supports these wars of deployment, employment, and sustainment. ADA plays a critical part throughout the deployment. If we deploy to the area of operation by sea, then the first elements in the area will most likely be naval and marine forces. In this event, the Navy will initially provide air defenses, including both offensive and defensive counterair aircraft as well as fleet missile defenses. As the lodgment is established, and as Army and Air Force air defense assets arrive, responsibility for air defense over the land area will revert to the Air Force. Of course, the contingency force commander will integrate any available host-nation air defenses into the overall scheme of operations.

Army air defense elements must be introduced early during the buildup of Army forces. The extreme vulnerability to air attack during this particularly critical phase of the operation requires that a premium be placed on effective air defense. This requires a mix of interceptors and ground-based ADA, as well as a mix of ADA assets, including high-to-medium-altitude air defense (HIMAD) and short-range air defense (SHORAD) systems. ADA command and control facilities must also be introduced in a timely manner. These facilities must have the organic capability to interoperate with both Navy and Air Force control facilities. The ADA community is currently working toward developing ways for Army ADA command and control facilities to directly interface with the Navy's E-2C and the Air Force's E-3A advanced early warning systems. This capability will insure that vital early warning and command and control information is provided and that in-theater defense planning can be accomplished to expedite the tactical employment of the follow-on forces. Our force introduction planning must be tailored specifically to the threat. If we anticipate a significant early ground threat, then we must allocate some critical lift assets to early movement of ground combat forces. On the other hand, if the air threat is more significant, then we must insure that adequate air defense elements are introduced early so that the lodgment area may be secured. It is essential during this crucial stage of the operation that we establish at least local air superiority to provide the commander unrestricted movement for both his strategic and tactical airlift. Only with the most carefully planned and orchestrated deployment can we expect to marshal sufficient forces in the lodgment area to fight the airland battle successfully.

The deployment phase is essentially complete once our combat forces have begun the movement into their tactical areas of operation. Air defense priorities permitting, as divisional areas of operation are defined and occupied, HIMAD assets from the supporting corps ADA will be positioned to complement the divisional SHORAD elements. Divisional SHORAD units will design their defenses based on the priorities established by the division commander. Our tactics must be responsive to the needs of the division and our mobility must be commensurate with that of the supported maneuver forces. Only then can ADA provide the required protection to the division commander's deep strike assets and maneuver forces. It is this

protection of the commander's essential intelligence sensors, command and control assets, and deep strike resources that allows him the flexibility to pursue the objectives of the airland battle.

The air defense mission during this phase is not, however, restricted to simply protecting divisional operations. ADA must continue to protect the corps commander's deep strike assets as well. Critical defensive and offensive air power may be based at long distances from the lodgment area. This will require ADA assets from the corps ADA organization to provide point defense of the forward operating bases. Thus, in the employment phase, we will find our ADA forces, both divisional and nondivisional, spread throughout the corps area of operations. Again, we must do more with less. The success of the commander's execution of the airland battle is highly dependent on our successful defense of his critical assets from air attack.

ADA supports the war of sustainment throughout both the deployment and employment phases. By destroying threat aircraft through the process of defending assigned priorities, we contribute to the improvement of our relative air parity or superiority position. By providing protection to our deep strike air assets, we contribute to the destruction of threat aircraft on the ground. The criticality of maintaining open lines of communications means that ADA must protect our strategic and tactical airheads and ports. As logistical complexes develop, they will also require more protection. Finally, there will be a need for protection of supplies during their movement forward. The vast distances expected in a contingency environment will severely tax our ability to provide protection to all convoys, but we must be prepared to provide air defense to the most critical ones. All of these factors require that we refine our command and control procedures to insure an integrated air defense capable of gaining and maintaining our ultimate objective — providing the commander freedom of operations virtually unrestricted by threat aircraft.

The family of air defense systems available to the contingency force commander includes Air Force and Navy interceptors, shipboard air defense systems, contingency corps HIMAD and SHORAD ADA, and divisional SHORAD. Command and control of this diverse family of systems

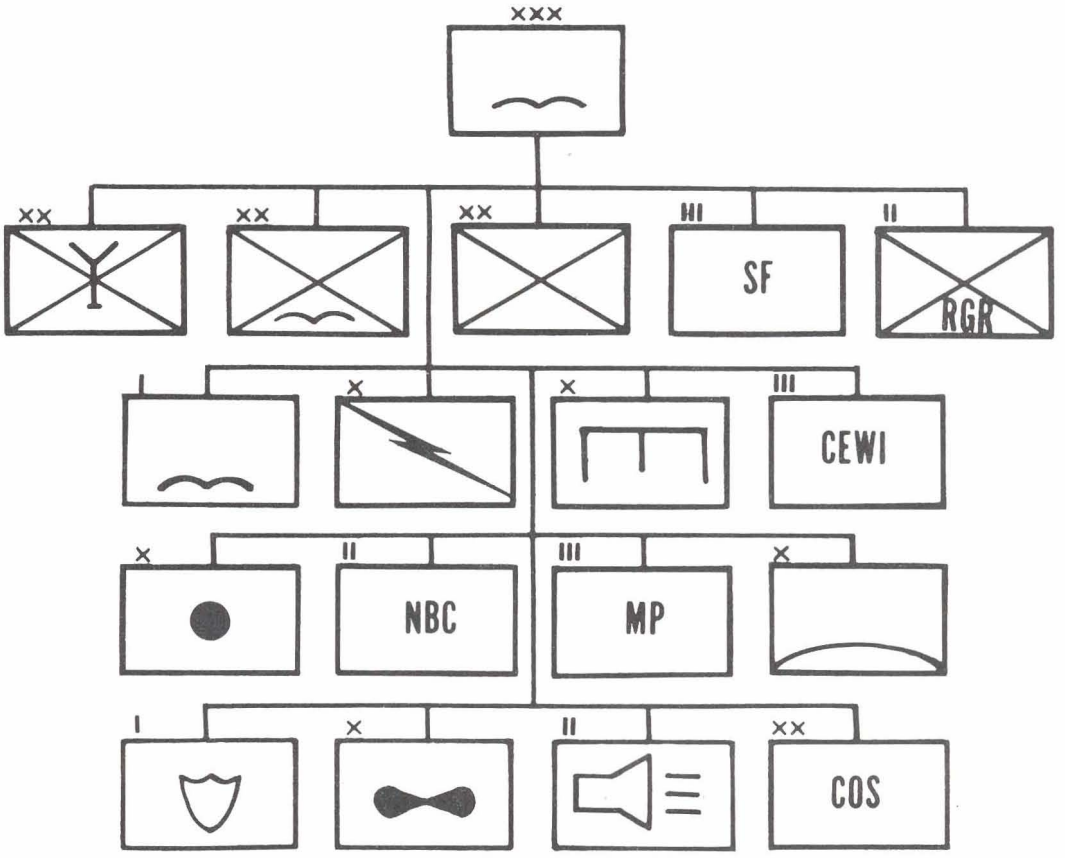


Figure 1. CONTINGENCY CORPS 86

will require the development and validation of procedures to insure the integration of all these elements into a single, coordinated air defense. As a part of the Army 86 study effort, we have defined a required force of ADA systems to support the contingency corps. This force consists of five Hawk battalions, each with three batteries of two assault fire units. Also, two SHORAD battalions provide terminal defense of critical assets. One battalion consists of SHORAD systems augmented by Stinger teams. The other battalion consists of four batteries of lightweight air defense systems (a developmental weapon system not yet in the force) again supplemented by Stinger. An ADA brigade headquarters, supported by a dedicated signal company, provides command and control. US Air Force airborne warning and control system (AWACS) aircraft provide long-range surveillance and interface either directly with HIMAD battalions or indirectly through the tactical operations center. Responsive and timely air-battle information is then exchanged by automatic data link from the brigade tactical operations center to the HIMAD battalions. Satellite communications systems will provide the required communications link across the extensive distances that we may encounter. Air defense liaison elements from divisional SHORAD battalions will interface with adjacent and supporting HIMAD units to exchange information and coordinate operations. Thus, the corps ADA brigade has the requisite mix of ADA systems to provide complementary defense of the corps, to supply necessary communications support, and to effect the high level of centralized control necessary to provide a cohesive air defense.

The ADA community has several initiatives planned or underway to insure that we can effectively fight on the airland battlefield. The 9th Infantry Division has begun an ambitious program to introduce new equipment, organizations, and fighting techniques to increase our fighting punch, while staying within airlift constraints. The division's "Reliable Slip" program, a procedure which provides a significant reduction of the airlift required to transport its SHORAD battalion, also offers great advantages in enhancing strategic deployability. At the US Army Air Defense School, we continue to participate in the ongoing series of Army 86 studies to develop organizations that will provide the most effective air defense for our contingency forces. The "get light" initiative of the 11th ADA Brigade, a program designed to task-organize and down-size tailored force packages to enhance the strategic deployability of both Hawk and SHORAD fire units, is another important contribution to this effort. Collectively, all of these initiatives significantly enhance the air defender's readiness for the airland battle in a contingency area.

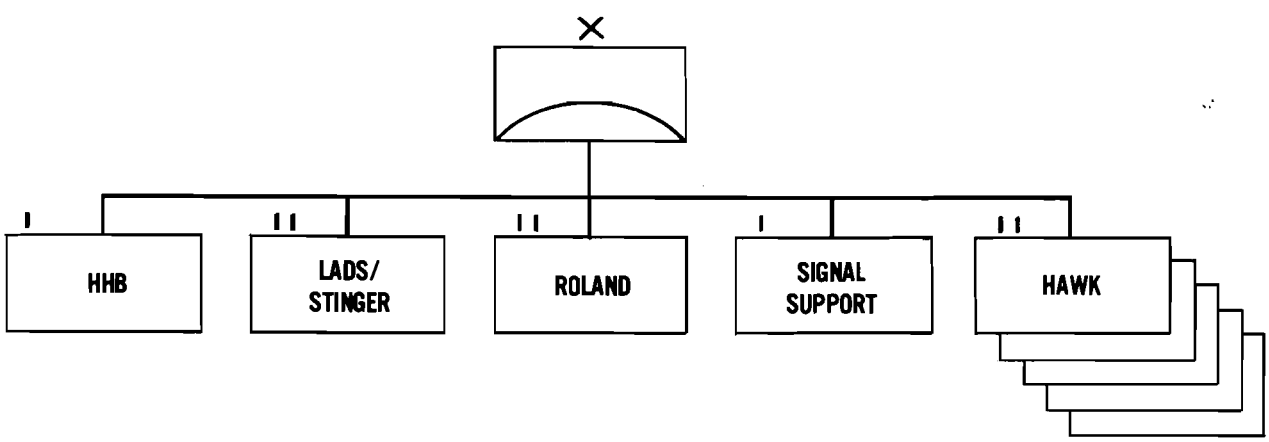


Figure 2. CONTINGENCY CORPS ADA BRIGADE
(Does not include organic divisional SHORAD)

WHAT DO YOU DO NOW,

LIEUTENANT?

by Chaplain (MAJ) Richard H. Whaley

As the battery executive officer, you have just left the battery commander's office where you were informed that tomorrow the unit would stand a USAREUR-level inspection. The battery commander has some concern about the ammunition inventory and wants it checked immediately. The last thing he said was, "Remember, this unit has never failed an inspection and I don't expect to start now. If you find any problems I expect you to take care of them—I am counting on you!"

Three hours later you and SSG Smith have completed your second inventory and have concluded that two boxes of .45 caliber ammunition are indeed missing.

SSG Smith says, "Don't worry, sir, I have a friend who will loan us the ammo, and I can 'doctor up' the paperwork so no one will ever know. Then, after we pass the inspection, you can reinventory and report the missing ammo." WHAT DO YOU DO NOW, LIEUTENANT?

Fortunately, not everyone is faced with ethical dilemmas such as this every day. Nevertheless, when they occur a great deal of mental anguish can result if the officer has not formed a workable ethical base from which to derive ethical leadership decisions. That base becomes essential when the desire to excel and succeed, coupled with loyalty to unit and commander, poses a powerful temptation to do the expedient thing. Yet, those same expedient decisions often have far-ranging impact and cause both individuals and institutions a great amount of difficulty. This is compounded by the fact that every decision by every officer may affect every other officer in his unit. Indeed, there are times when the officer corps is only as good as its weakest officer.

Recently within the Army, events have indicated a need for the officer corps to review its ethical behavior and to insure it meets the highest standards of "Duty, Honor, Country." Certainly, to fall short of those standards endangers the basic mission of the Army: the defense of our nation.

All of this is true, but from whence does an officer derive the ethical foundation that will help him keep his attention focused on the lofty ideals of "Duty, Honor, Country?" It is always good advice when in need of assistance to turn to the basics. And most basic to the military profession are those two documents that bring an officer into the military and which, too often, are read once and then forgotten: the oath of office and the officer's commission. Both documents need to be read regularly and the values they embrace constantly kept fresh in mind and emulated.

In the oath of office (which you took voluntar-

ily and without compulsion) you, lieutenant, committed yourself to a solemn and specific goal: to support and defend the American way of life as based upon the United States Constitution. You promised to do this against "all enemies foreign and domestic," to "bear true faith and allegiance to the same," and to "well and faithfully discharge the duties of your office." These are solemn vows calling upon you, if necessary, to fight and die in supporting and defending this way of life.

Implied within the oath is the requirement for you to know and understand what the Constitution means, how its ideals and principles are implemented in a free society, and how the process works and your role within it. A big challenge!

Later, you received your officer's commission signed by the President of the United States. In it, you learned that the entire nation, through the elected President of the people, had placed upon you a special and unique "trust and confidence in (your) patriotism, valor, fidelity, and abilities." No other citizen of this nation has been given such a "vote of confidence" as have those military officers; yes, you are indeed recognized as a very special person. To place the defense of a nation and the protection of its people upon the shoulders of a select group of people is not only a great honor, it is also a sobering responsibility. That honor has been placed on your shoulders.

But with that commission came the requirement to perform in that office to your utmost ability. You were given the right to issue legal orders to subordinates with the full knowledge that those orders could result in the death of others as they, and you, accomplished wartime missions. Conversely, you were charged to be obedient to the President and all superior officers as they discharged their similar responsibilities.

Thus, as each officer performs his duty, he contributes to the total effort of the Army mission. Although there may be officers who, for whatever reason, fail to live up to their oath or commission, that is no justification for you not live up to yours. Your character and integrity must be built upon basic ethical principles. Your superiors, and ultimately your nation, require from you truth in action and deed as well as your very best abilities— regardless of personal cost.

Difficult to do? Yes, sometimes it is. But is there really a viable option? Can you really afford to do less than the best? So much rests upon your shoulders: a career of honest service; a competent and credible Army; a secure nation.

So, lieutenant, given the opening situation: what do you do now?

CHAPLAIN WHALEY *graduated from San Jose College and was commissioned a 2LT in Air Defense Artillery. He graduated from the ADA Officer Basic Course and served as unit commander in Germany and Vietnam. He later received a master's degree at Brigham Young University and was subsequently granted a branch transfer into the Chaplain's Corps. He is a graduate of the Chaplain's Basic and Advanced Courses and has served as a chaplain at home and in Germany.*

DEPARTMENT OF THE ARMY

Lineage and Honors

7th AIR DEFENSE ARTILLERY

Constituted 8 March 1898 in the Regular Army as the 7th Regiment of Artillery

Organized 29 March 1898 at Fort Slocum, New York

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 7th Coast Artillery and organized with Headquarters at Fort Hancock, New Jersey

(2d Battalion inactivated 28 February 1930 at Fort Hancock, New Jersey; 1st Battalion inactivated 7 April 1930 at Fort Hancock, New Jersey; 1st and 2d Battalions activated 11 January 1941 at Fort Hancock, New Jersey)

Regiment (less 2d Battalion) inactivated 7 April 1944 at Fort Leonard Wood, Missouri

(2d Battalion inactivated 13 April 1944 at Camp Chaffee, Arkansas)

Disbanded 14 June 1944

Reconstituted 28 June 1950 in the Regular Army and its elements consolidated and redesignated as follows:

Headquarters and Headquarters Battery consolidated with Headquarters and Headquarters Battery, 7th Antiaircraft Artillery Group (see ANNEX 1) and consolidated unit designated as Headquarters and Headquarters Battery, 7th Antiaircraft Artillery Group

1st Battalion consolidated with the 126th Antiaircraft Artillery Gun Battalion (see ANNEX 2) and consolidated unit redesignated as the 7th Antiaircraft Artillery Battalion

7th AIR DEFENSE ARTILLERY

2d Battalion consolidated with the 26th Antiaircraft Artillery Automatic Weapons Battalion (active) (see ANNEX 3) and consolidated unit designated as the 26th Antiaircraft Artillery Automatic Weapons Battalion, an element of the 24th Infantry Division

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

Headquarters and Headquarters Battery, 7th Antiaircraft Artillery Group activated 20 January 1952 at Fort Stewart, Georgia
Inactivated 15 January 1953 at Fort Stewart, Georgia
Activated 1 May 1954 in Korea
Inactivated 20 January 1955 in Korea
Activated 1 July 1955 in Greenland
Redesignated 20 March 1958 as Headquarters and Headquarters Battery, 7th Artillery Group
Inactivated 20 December 1965 at Fort Totten, New York

7th Antiaircraft Artillery Battalion redesignated 13 December 1951 as the 7th Antiaircraft Artillery Automatic Weapons Battalion
Activated 20 December 1951 at Camp Edwards, Massachusetts
Redesignated 30 June 1955 as the 7th Antiaircraft Artillery Battalion
Inactivated 1 September 1958 in Germany

26th Antiaircraft Artillery Automatic Weapons Battalion redesignated 1 January 1953 as the 26th Antiaircraft Artillery Battalion
Inactivated 15 October 1957 in Korea
Relieved 5 June 1958 from assignment to the 24th Infantry Division

Headquarters and Headquarters Battery, 7th Artillery Group; the 7th and 26th Antiaircraft Artillery Battalions, and the 7th Field Artillery Battalion (organized in 1916) consolidated, reorganized, and redesignated 20 December 1965 as the 7th Artillery, a parent regiment under the Combat Arms Regimental System

7th Artillery (less former 7th Field Artillery Battalion) reorganized and redesignated 1 September 1971 as the 7th Air Defense Artillery, a parent regiment under the Combat Arms Regimental System (Former 7th Field Artillery Battalion concurrently reorganized and redesignated as the 7th Field Artillery - hereafter separate lineage)

* * *

ANNEX 1

Constituted 5 August 1942 in the Army of the United States as Headquarters and Headquarters Battery, 7th Antiaircraft Artillery Automatic Weapons Group

Activated 1 September 1942 at Camp Haan, California

7th AIR DEFENSE ARTILLERY

Redesignated 26 May 1943 as Headquarters and Headquarters Battery, 7th Antiaircraft Artillery Group

Inactivated 17 February 1946 at Camp Kilmer, New Jersey

ANNEX 2

Constituted 25 February 1943 in the Army of the United States as the 126th Coast Artillery Battalion

Activated 10 May 1943 at Camp Haan, California

Redesignated 28 June 1943 as the 126th Antiaircraft Artillery Gun Battalion

Inactivated 3 January 1946 at Camp Patrick Henry, Virginia

ANNEX 3

Constituted 25 February 1943 in the Army of the United States as the 784th Coast Artillery Battalion

Activated 10 April 1943 at Fort Bliss, Texas

Redesignated 30 April 1943 as the 784th Antiaircraft Artillery Automatic Weapons Battalion

Inactivated 31 December 1945 in Germany

Redesignated 13 October 1948 as the 26th Antiaircraft Artillery Automatic Weapons Battalion and allotted to the Regular Army

Assigned 20 March 1949 to the 24th Infantry Division and activated in Japan

* * *

CAMPAIGN PARTICIPATION CREDIT

World War II	Korean War
Normandy	UN defensive
Northern France	UN offensive
Rhineland	CCF intervention
Ardennes-Alsace	First UN counteroffensive
Central Europe	CCF spring offensive
England 1944	UN summer-fall offensive
	Second Korean winter
	Korea, summer 1953

7th AIR DEFENSE ARTILLERY

Vietnam
Defense
Counteroffensive
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

DECORATIONS

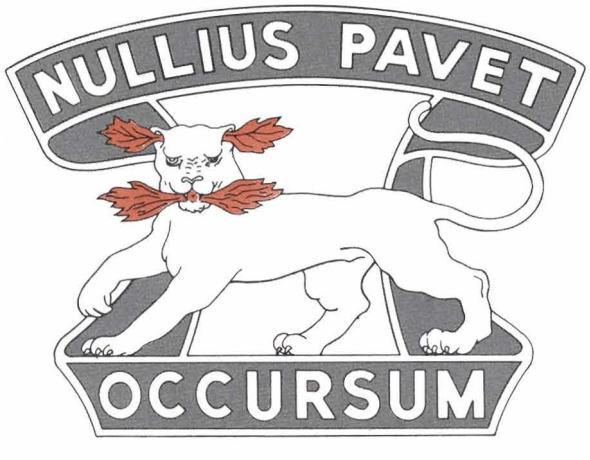
Presidential Unit Citation (Army), Streamer embroidered DEFENSE OF KOREA

Meritorious Unit Commendation, Streamer embroidered VIETNAM 1966-1967

Meritorious Unit Commendation, Streamer embroidered VIETNAM 1967-1968

BY ORDER OF THE SECRETARY OF THE ARMY:

VERNE L. BOWERS
Major General, USA
The Adjutant General



AD LASER SIMULATOR TESTED

The new Air-to-Ground Engagement Simulator/Air Defense (AGES/AD) has been undergoing extensive testing on its way to possible production.

AGES/AD is part of the Multiple Integrated Laser Engagement System (MILES), in which weapons are equipped to fire laser beams instead of ammunition at a target. The laser beams send out coded words and the target system decodes the words to decide if it has been killed. A hit or near miss is signaled instantly by a beacon light, a buzzer, or smoke which emanates from the target.

SP6 Judson Dosher tests the AGES/AD system adapted to the Stinger at the US Army Electronic Proving Ground. A blast of smoke simulates the firing of the weapon.

Last summer, AGES/AD underwent Phase I operational testing at the US Army Electronic Proving Ground, Fort Huachuca, Arizona. Phase II testing was accomplished at Fort Bliss, Texas, from September to October 1981. Currently, AGES/AD is being given factory tests at Xerox Electro-Optic Systems, Pasadena, California. Their testing includes environmental and reliability studies.

Some changes will be incorporated into the AGES/AD system as a result of the tests conducted at Fort Huachuca and Fort Bliss. In March 1982, a decision will be made as to whether AGES/AD will go into production or undergo further testing.

1,000th STINGER

General Dynamics Pomona Division has produced its 1,000th Stinger air defense missile system.

The initial Stinger production lot was delivered to the Army in December 1979, and since then additional production lots have been delivered to the Army and Marine Corps. Stinger was fielded in Europe in February 1981.

Stinger, a manportable, shoulder-launched, fire-and-forget air defense system, protects ground forces against attack by low-flying, high-speed jet aircraft and helicopters and offers advancements over the Redeye missile system. These advancements include improvements in propulsion and greater resistance to enemy countermeasures.

General Dynamics is currently producing Stinger units and ground support equipment under a contract calling for production through July 1983.

ENLISTED CAREER NEWS

ROTC ACTIVE DUTY SCHOLARSHIPS

Soldiers who've been thinking about college, but who may have been wondering how they might finance the venture, can cast their eyes toward an ROTC scholarship as a possible solution.

Army ROTC has reserved 100 scholarships for active duty enlisted soldiers. These scholarships cover tuition, textbooks, laboratory fees, and certain other education expenses. For example, if one college major requires using a calculator or a slide rule, the Army will buy one or the other.

The Army will also pay scholarship winners $100 a month, up to $1,000 for each academic year, in tax-free subsistence allowance. Cadets also get paid for the 6-week advanced camp, which they must attend in the summer between their junior and senior years.

Scholarship winners can also use any GI Bill or Veterans Education Assistance Program (VEAP) benefits they may have earned while on active duty. The nearest Veterans Administration regional office can determine eligibility.

Last year, the Army expanded the active duty scholarship program to give more soldiers the chance to apply. There is a new 3-year scholarship, along with the 2-year award.

In addition, some rule changes have extended the age limit by giving soldiers credit for active service.

For example, according to the old rules, applicants had to be younger than 25 on 30 June of the year in which they would be commissioned. Under the new rule, the maximum age is now younger than 29 on 30 June of the commissioning year.

To apply for ROTC active duty scholarships, soldiers must:

- Be US citizens.
- Be at least 17 years old before the scholarship becomes effective.
- Have served at least 1 year active duty.
- Have been accepted for enrollment by a college or university that offers ROTC (or the applicant must be able to make arrangements to attend ROTC classes at a nearby school which does).
- Have a score of at least 115 on the general technical aptitude test.
- Have a satisfactory National Agency Check.
- Have kept a "C" average in college work.
- Have 2 years of college credit for a 2-year scholarship, or 1 year of college credit for a 3-year scholarship.
- Be recommended for the scholarship by their commanders.

Soldiers will be discharged from active duty to enter college. Once their scholarships are in effect, they will be Army ROTC cadets.

Individuals can major in any area that leads to a bachelor's degree except theology. They can take part in any extracurricular activity which doesn't interfere with military science requirements. Scholarship cadets will receive commissions as regular Army or Army Reserve second lieutenants after completing all requirements and graduating. They must then serve 4 years on active duty.

For applications, or for more information, interested soldiers should write: Army ROTC, HQ TRADOC, ATTN: ATRO-CS, Fort Monroe, Virginia 23651.

Soldiers must request scholarship applications for the 1982 - 1983 school year between 15 January and 15 April 1982. If the request isn't received by 15 April, it can't be processed for this year cycle. Completed applications must reach HQ TRADOC postmarked no later than 1 May 1982.

PROMOTION POINTS FOR AAM

The new Army Achievement Medal (AAM) allows 15 promotion points for soldiers advancing to the grades of E-5 and E-6, according to the Army's Military Personnel Center (MILPERCEN). The medal is one of four awards that took effect August 1981. The AAM, however, is the only one worth promotion points.

All active Army, National Guard, and Army Reserve soldiers may be recommended for the AAM which requires approval by a commander in the grade of colonel. Colonels in noncommand positions, such as department heads or directors, cannot act on the recommendations.

The AAM's promotion point value makes it comparable to the Army's Purple Heart, also worth 15 points. The medal's ribbon will be worn after the Army Commendation Medal (ARCOM) and above the Purple Heart on the Army green uniform. The medal will be awarded to servicemembers for important achievements deserving special recognition, but not considered as qualifying for the ARCOM. The ARCOM is worth 20 promotion points.

The AAM should appear soon in post exchanges, but probably will not be available through the normal supply systems until late 1982. In the meantime, soldiers receiving the awards will be presented sets of orders and certificates.

RECRUITING A SECONDARY RATHER THAN PRIMARY MOS

Effective 1 October 1981, soldiers assigned to recruiting duty after completing the Army Recruiter Course are awarded the recuiting MOS as a secondary rather than primary specialty.

The change came about because soldiers who were assigned to recruiting duty as a primary specialty were required to take a skill qualification test (SQT) in recruiting. Many felt it was unfair to be judged for promotion based on the recruiting SQT when they had spent the majority of their careers in a different MOS. According to new guidance, soldiers assigned to the Recruiting Command will maintain their primary MOS, whatever that may be, while serving in a recruiting assignment as a secondary specialty. This will allow recruiters to continue taking SQTs in their more familiar skills, although they will be SQT-exempt during their recruiting tours.

Recruiting duty tours last for 3 years. During that time, soldiers serving in recruiting assignments will continue to be considered for promotion in their designated primary MOS.

All soldiers assigned to recruiting duty after 1 Febuary 1979 will be reclassified into their normal primary specialty.

—Army Information Radio Service

COMMON TASK SQT

Soldiers who aren't working in an MOS with a specific skill qualification test (SQT) can now look forward to something new in their individual training. As of December 1981, these soldiers, along with Reserve Component soldiers, began taking the Common Task Skill Qualification Test (CTSQT).

The CTSQT consists of tasks applicable to every soldier in skill levels 1 through 4. The tests are designed to evaluate soldiers on common basic skills.

Two new field manuals contain the common tasks which make up the CTSQT. These new manuals, titled "Soldier's Manual of Common Tasks," were distributed to units worldwide last year. FM 21-2 addresses skill level 1, and FM 21-3 addresses skill levels 2, 3, and 4.

The CTSQT contains the critical tasks soldiers must be able to perform to survive and win on the modern battlefield. Like the MOS-specific SQT, the CTSQT is organized into three parts: skill component (SC), hands-on component (HOC), and job site component (JSC). Sixteen tasks are covered, but some of these are so important that they are also contained in applicable MOS-specific SQTs.

The CTSQT does not replace the MOS-specific tests. If soldiers have already taken an MOS-specific SQT during the past year, or if they will take one before November 1982, they will not take the CTSQT.

Some of the common tasks soldiers must be able to perform are:

- Camouflaging themselves and their individual equipment.
- Using challenges and passwords.
- Identifying natural and manmade terrain features on a map.
- Using first aid techniques, including cardiopulmonary resuscitation.

The CTSQT will be administered through 31 August 1982. Units will be required to schedule all eligible soldiers for testing during this period. For more information on the program, soldiers should contact their local training standards officer. Commanders will announce the training and test sites for their soldiers as this information becomes available.

BARS to STARS

OPMD UPDATE

OFFICER CIVILIAN EDUCATION

The Army's minimum educational goal for commissioned officers is a bachelor's degree and for warrant officers an associate degree before completing 15 years of service. Currently, 98 percent of the commissioned officers and 55 percent of the warrant officers meet this goal.

To satisfy the special needs of the service, Congress approved a ceiling of 4,900 positions Army-wide for civilian education training (bachelor and postgraduate degree program). In order to determine requirements for specific education disciplines, the Army Education Requirements Board (AERB) was formed. The AERB meets three times each year to validate all such requirements.

Although many officers have personal education desires, the Army can only support advanced degree education in shortage and validated disciplines, in disciplines commensurate with the officers' specialties, and for specific assignments such as instructors at the US Military Academy.

Currently, the US Army Military Personnel Center is authorized to send 440 commissioned officers a year for fully funded graduate programs. Additionally, 200 officers annually attend partially funded programs such as the Cooperative Degree Program, the Degree Completion Program, and the Advanced Degree Program for ROTC instructor duty.

For more information about officer civilian education programs, write:

HQDA MILPERCEN,
ATTN: DAPC-OPP-E,
200 Stovall Street, Alexandria, VA 22332

or call:

AUTOVON 221-0685/8100/0684.

COMBINED ARMS ADVANCED COURSES

In the future, more combined arms officers will be scheduled to attend branch advanced courses other than their own. Presently, the MILPERCEN goal is to have a total of 235 officers attend either the Infantry, Field Artillery, Armor, Engineer, or Air Defense Artillery advanced course instead of their own basic branch advanced course.

The following chart shows the breakdown of numbers to be scheduled.

ADVANCED COURSE	OFFICERS BY BRANCH (per class)					TOTAL PER YEAR
	IN	AR	FA	ADA	EN	
INFANTRY (5 classes/yr)	—	10	5	3	1	95
ARMOR (4 classes/yr)	15	—	2	1	1	76
FIELD ARTILLERY (4 classes/yr)	6	3	—	1	—	40
AIR DEFENSE ARTILLERY (4 classes/yr)	1	1	1	—	—	12
ENGINEER (6 classes/yr)	1	1	—	—	—	12
TOTAL						235

In addition to the numbers listed in the chart, the Signal Corps Branch will select four Signal Corps officers to send to combat arms advanced courses, and the combat arms branches will select four officers to attend the Signal Corps advanced course.

If a school programs additional courses, the number of officers attending advanced courses other than their own would vary from year to year.

BULLETIN BOARD

General Information

AMERICAN CHILDREN BORN OVERSEAS

Children born to American parents in foreign countries are American citizens by birth under federal law. The catch comes when and if you have to prove it.

In almost every instance, these births are registered with the US embassy in the country of birth. Many parents, however, assume erroneously that no further action should be taken to establish the child's citizenship.

Registration of a child's birth with the State Department or with the American consulate or embassy overseas does not serve as absolute proof of citizenship. It does serve to record that the birth occurred.

Upon the parents' return to the states, they should apply to the nearest office of the Immigration and Naturalization Service for a certificate of citizenship for their foreign-born child. This certificate can be used with assurance in instances where proof of citizenship is required.

To obtain a certificate, parents must file a Department of Justice Form N-600, Application for Certificate of Citizenship, with the nearest immigration office.

In addition, the birth certificates and marriage certificate of both parents, the child's birth certificate issued by the foreign government or the oversea US hospital, three photographs of the child, and a $15 fee must accompany the N-600 application.

If no birth certificate is available, the Department of State Form FS-240, Report of Birth Abroad, can be submitted. The immigration office will accept copies of this form filed with the N-600.

Persons needing additional information should contact their post legal office.

—This article was written by Alonzo S. Westbrook, Keesler Law Center, Keesler Air Force Base, Mississippi.

FAMILY HOTLINE NOW AVAILABLE

The Army Chief of Staff has approved a 24-hour communications system for family members in the Continental United States (CONUS) to confer with the Department of the Army.

Family Life Communications Line (FLCL), located in the Pentagon, became operational on 8 September 1981. It enables callers to obtain information on programs affecting family life.

The system serves family members of active duty personnel, Army National Guard, Army Reserve, retirees, and DA civilians. FLCL will allow family members to request information and assistance, to comment on current Army plans and programs, and to communicate with DA on matters of concern and interest.

Phones are manned by trained personnel during normal duty hours. Calls received during nonduty hours are recorded and answered as soon as possible.

The toll free service number provided for family members in CONUS is 1-800-336-5467.

Many callers have questions that usually can be answered at the local level; therefore, questions should be *first referred* to the commander or appropriate local agencies before using the FLCL.

The FLCL is one of the initiatives resulting from the first Army Family Symposium held in October 1980, in conjunction with the annual meeting of the Association of the United States Army. Many delegates expressed a need for family members to have a way to communicate directly with the Army about matters and policies that affect their lives.

AIRLINES OFFER 50 PERCENT OFF

The Military Traffic Management Command has been successful in getting many major US airlines to participate in a 50-percent furlough fare

program. This special air travel discount provides a reserved seat on domestic flights to active duty military personnel traveling on leave or pass at their own expense. The discount is also available to servicemembers who have been discharged from active duty and are traveling within 7 days of their discharge date.

Although many soldiers are taking advantage of the military air fare discount, a good number of service members, especially enlisted personnel, are still unaware of this important benefit. Because the airlines will continue to offer this fare based on the number of personnel who use it, those individuals in a position to direct attention to the program are urged to spread the word.

Travelers should shop around for other reduced fares which may be as low or lower than furlough fares. However, travelers should be aware that most "supersavers" and excursion fares contain restrictions on length of stay and ticket purchase deadlines, while the 50-percent fare is unrestricted.

STATE UNEMPLOYMENT

Soldiers leaving the Army are no longer automatically eligible to receive state unemployment compensation. Army officials say claims for benefits are now based on the reason for separation and the type of discharge a soldier receives.

A law signed by the President last August disqualifies soldiers who resign, voluntarily leave the military after completing the service contract, or are released or discharged "for cause." It is retroactive to include soldiers separated since 1 July 1981.

States are now determining a soldier's eligibility for unemployment compensation on a case-by-case basis. If a question about eligibility exists, some state agencies have been more lenient than others in awarding the benefits to former servicemembers, officials report.

Generally, under the new law, a soldier who is eligible to reenlist, but who leaves the military voluntarily after completing the service contract, no longer may receive unemployment compensation.

Officials suggest soldiers check with their state employment agencies to make sure of their eligibility.

ENLISTED SOLDIERS PAY HOSPITAL MEALS

A Department of Defense change that became effective 15 September 1981 requires ALL enlisted personnel to pay the daily subsistence rate for each day in a military hospital.

A recent message explains that the intent of the change is to pay officers and enlisted personnel basic allowance for subsistence (BAS) uniformly. Formerly, a payment of BAS for enlisted soldiers was suspended when they were in a patient status.

Now, when enlisted soldiers leave the hospital, they will be required to pay the daily subsistence rate of $3.70 before leaving the facility. Soldiers who do not receive BAS will be reimbursed in their monthly pay for the subsistence costs they incurred in the hospital.

DA is currently exploring means to centralize the collection of daily hospital subsistence costs and have it collected automatically through the US Army Finance Center.

This change will apply to all active duty enlisted military personnel, including Reserve and National Guard members. No change has been announced yet regarding the entitlement of retired enlisted personnel to hospital subsistence without charge while they are in a patient status.

ENLISTED SHOULDER MARKS

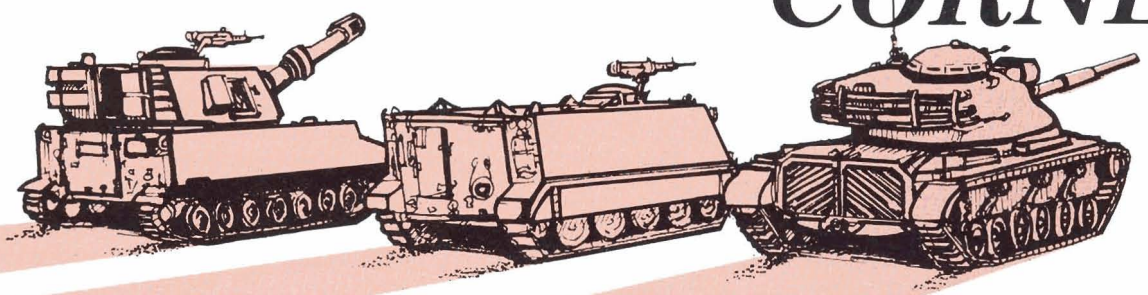
The new black enlisted shoulder marks come in two different sizes for wear by men or women soldiers. The large size is designed to fit the epaulets of men's green shirts, size 15½ and above. The small size is the same width, but it is almost an inch shorter for wear with all women's blouses and with men's shirts sizes 15 and below.

The shoulder marks are now for sale at post exchange stores and cost about $4. They are designated for wear by corporals E-4 and all specialists and NCOs E-5 through E-9. The grade insignia is embroidered on the cloth. In addition to wear on the green shirt, the marks will be required for use on the shoulder loops of the new black pullover sweater.

Soldiers are not required to buy the new shoulder marks. They may continue to wear the metal rank insignia now worn on the collar of the green shirt until the marks are issued at promotion or until 30 September 1983, whichever comes first. Junior enlisted soldiers not authorized to wear the shoulder marks will continue to wear their insignia pinned to the shirt collar.

No date has been set for the shoulder marks to become available through the Army's normal supply channels.

COMBINED ARMS CORNER



NEW MILITARY HANDGUN

The Department of the Army is taking the first step toward making the 9-mm handgun the standard handgun for all military services.

The Army has requested contract proposals for producing 220,000 of the new weapons. Designated the XM9, the handgun will replace the .45-caliber pistol and the .38-caliber revolver now in use. A contract award is expected early this year after contract proposals are evaluated.

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

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

The 9-mm ammunition is already standard for NATO weapons. Advantages claimed for the new weapon include reduced weight, improved safety and reliability, and reduced recoil. Also, it has a higher hit probability, double-action firing, and needs less training for operation.

BLACK HAWK PROGRAM YIELDS NEW BENEFIT

A $2.35-million Black Hawk helicopter composite rear fuselage program, designed to reduce weight and costs, has reportedly yielded another plus. The new structure provides ballistic protection for the aircraft's fuel cells, according to an announcement from the Army Aviation Research and Development Command.

A significant milestone was passed when ballistic testing of Kevlar glass fiber and graphite panels filled with rigid foam were hit with 23- and 30-millimeter, high-explosive, incendiary rounds. Tests revealed that considerable structural damage was induced but the panels were completely successful in preventing fuel fires.

According to Colonel Donald K. Andreson, Black Hawk project manager, "Since fire is one of the major threats to the survival of an aircraft in combat, this test achievement must be considered a significant accomplishment towards demonstrating the fire prevention effectiveness of the composite structure with the rigid foam application." The ballistic testing portion of the composite program took place at Aberdeen Proving Ground, Maryland.

Principal goals of the Black Hawk rear fuselage helicopter composite program are to reduce manufacturing costs by 35 percent and aircraft weight by 10 percent.

GUARD GAINING PEOPLE, EQUIPMENT

The National Guard is putting renewed emphasis on its role in the total force by improving equipment procurement and force modernization. The chief of the National Guard Bureau, Lieutenant General LaVern E. Weber, cited two examples during a recent conference of the National Guard Association of the United States:

- Issuance of chemical defense equipment to early deploying Army National Guard (ARNG) units.
- Equipping 13 of the 19 Air National Guard (ANG) tactical airlift units with newer model C-130 aircraft.

General Weber stated that the ARNG recently activated 17 new units and the ANG will also increase the number of its air defense units. In addition, Guam has become the third US territory to form a National Guard.

Personnel strength in both the ARNG and the ANG continues to rise, with an increase of more than 17,000 in the ARNG and approximately 1,500 in the ANG since the end of 1980.

General Weber provided illustrations of the Guard's outstanding performance in joint training exercises over the past year. Among these was REFORGER 81, involving 14 ARNG units and unit cells, including an entire infantry battalion of 702 personnel.

Also of special note was Bright Star 81. It was the first operation of the US Rapid Deployment Force for which the New Mexico ANG provided the tactical air support. Eight ANG A-7Ds flew nonstop from Pease Air Force Base, New Hampshire, to Cairo West Air Base, Egypt. In addition, 70 percent of the combat communications units involved in Bright Star were from the ANG.

General Weber emphasized the need for increased public support for the National Guard in the coming years to meet recruiting goals and gain adequate resources.

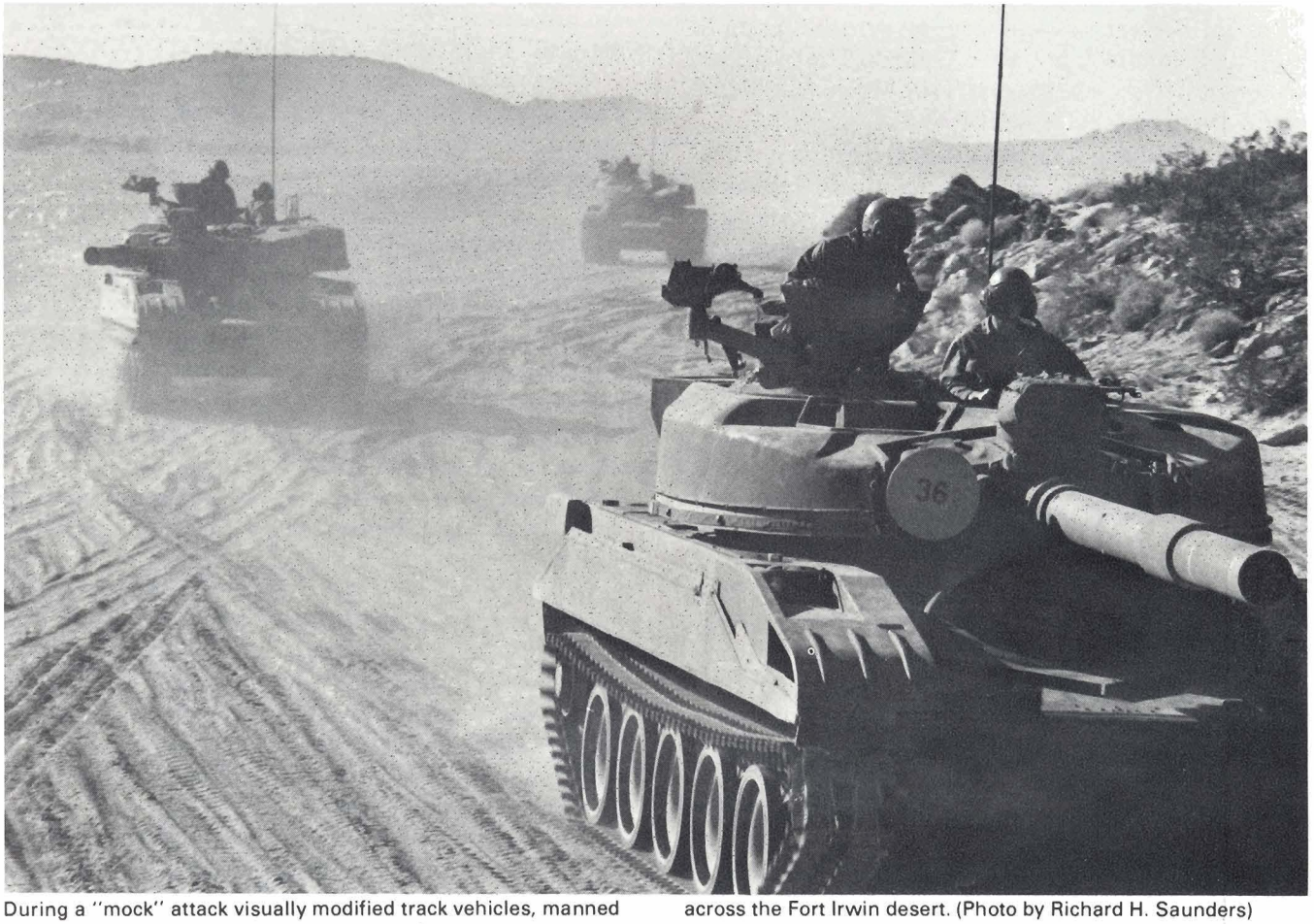
NATIONAL TRAINING CENTER

Last summer Fort Irwin, California, was officially reactivated as an Active Army post. For 10 years the fort had been under the control of the California National Guard. Fort Irwin is now the Army's National Training Center (NTC).

Under the NTC concept, plans call for every combat battalion in the Continental United States to rotate through Fort Irwin for 2 weeks of intensive training once every 18 months. The rotating units will use a specially instrumented, live-fire training area and face the NTC opposing force. This force will be the best-trained and equipped unit of its sort in Army history. The NTC opposing force consists of the 6th Battalion, 31st Infantry (Mechanized), and the 1st Battalion, 73d Armor.

Opposing force soldiers will wear distinctive uniforms, use visually modified equipment resembling Soviet-style armor, and be trained in Soviet military tactics.

Space availability was a major reason behind the selection of Fort Irwin as the NTC. While training at the NTC, Army heavy battalions will be able to use all of the weaponry that would be available to them in a combat situation. Smoke, artillery, attack helicopters, close air support, and electronic and chemical warfare will be employed to simulate a realistic battlefield environment.



During a "mock" attack visually modified track vehicles, manned by the National Training Center's Opposing Force, make their way across the Fort Irwin desert. (Photo by Richard H. Saunders)

CARIBBEAN COMMANDS CONSOLIDATE

To streamline the command structure in the Caribbean region, two military commands were consolidated on 1 December 1981 to form a single new organization. Basically, it involved the bringing together of the current Caribbean Contingency Joint Task Force with the Antilles Defense Command.

The new organization, US Forces Caribbean, will involve a staff of personnel from all services plus an active Naval component.

Personnel currently assigned in the Caribbean area will feel little effect as a result of the consolidation.

—Army Information Radio Service

AHIP HELICOPTER CONTRACT AWARDED

The US Army announced recently that the winner of the Army Helicopter Improvement Program (AHIP) industry competition to develop a near term scout helicopter is Bell Helicopter Textron.

The multiyear, $148-million contract calls for the design, modification, and test of five prototype aircraft. A successful development program will lead to modification of 720 OH-58A helicopters to the new Army Scout configuration. Estimated value of the subsequent modification program is $1 billion.

The winning design will incorporate advanced television and infrared sensors located in a sight mounted above the rotor system.

Major technical improvements in the aircraft include:

- Mast-mounted sight—Provides day and night long-range vision for the scout crew as well as allowing precision laser designation for precision-guided munitions. The above-rotor location enhances the survivability of the helicopter by enabling it to remain hidden while locating targets for the Army's weapon systems.
- Four-bladed, soft-in-plane composite main rotor—Provides the agility required for precise helicopter control in the nap-of-the-earth environment while offering an extremely low vibration environment for the mast-mounted sight and the scout crew.
- Improved tail rotor—Provides accurate heading control in winds up to 35 knots from any direction, assisting the stabilization of the sight in maintaining the target area as well as providing a margin of safety for the scout crew.
- First fully integrated, multiplexed cockpit offered for any Army helicopter—Provides the cockpit control and display subsystem which greatly simplifies the scout crew workload and provides rapid target handoff to other weapon systems.
- Power matched drive train—Insures excellent scout performance when operating with the Army's newest helicopters, anywhere in the world, day or night.

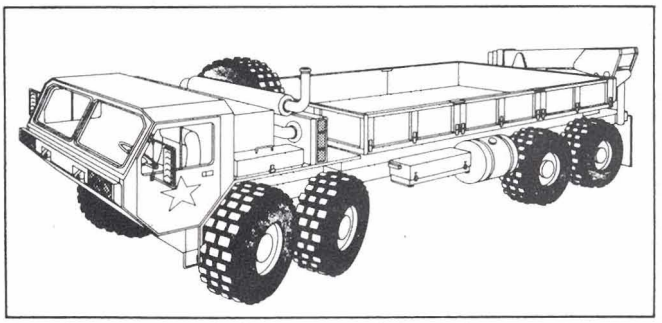
A model of the AHIP near term scout helicopter.

ARMY BUYS NEW HEAVY TRUCK

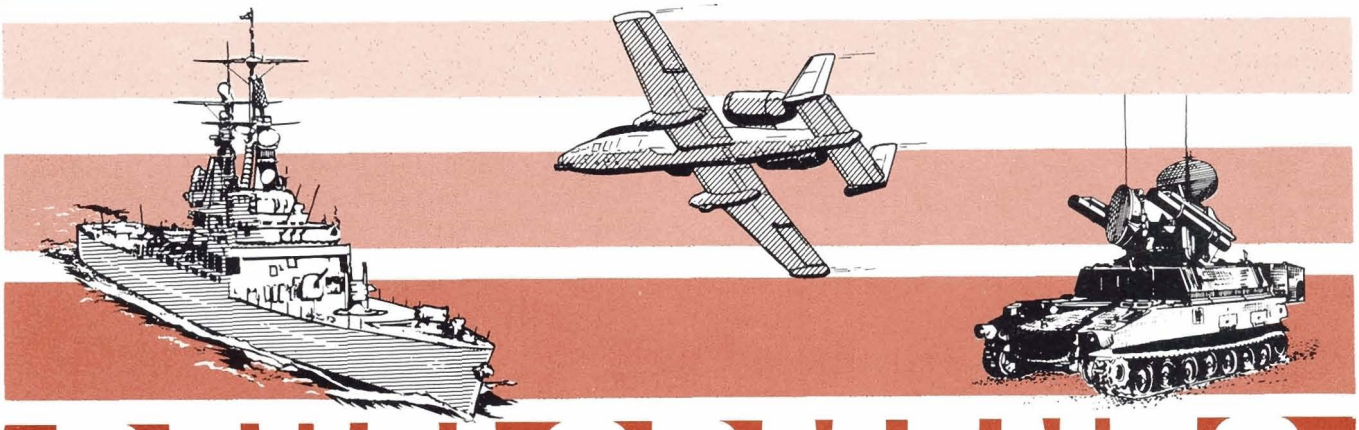
The Army Tank-Automotive Command has awarded a contract for more than $250 million to the Oshkosh Truck Corporation for production of the Army's new 10-ton truck, the M977-series of heavy, expanded mobility, tactical trucks. The Army will receive 2,140 trucks over 5 years, with an option to buy an additional 5,350 vehicles.

The M977-series includes five truck models: two cargo haulers, a petroleum tanker, a tractor, and a wrecker. The trucks are designed to perform such combat service support functions in the forward area as hauling ammunition to transfer points, transporting missile and rocket systems, and recovering materiel from the battlefield. Each truck is powered by an 8-cylinder, 435-horsepower diesel engine and can carry up to 22,000 pounds of cargo.

The first 250 trucks will be delivered and fielded in 1982.



Artist's conception of a heavy, expanded mobility, tactical truck.



DEVELOPMENTS

XV-15 TILT ROTOR AIRCRAFT TESTED

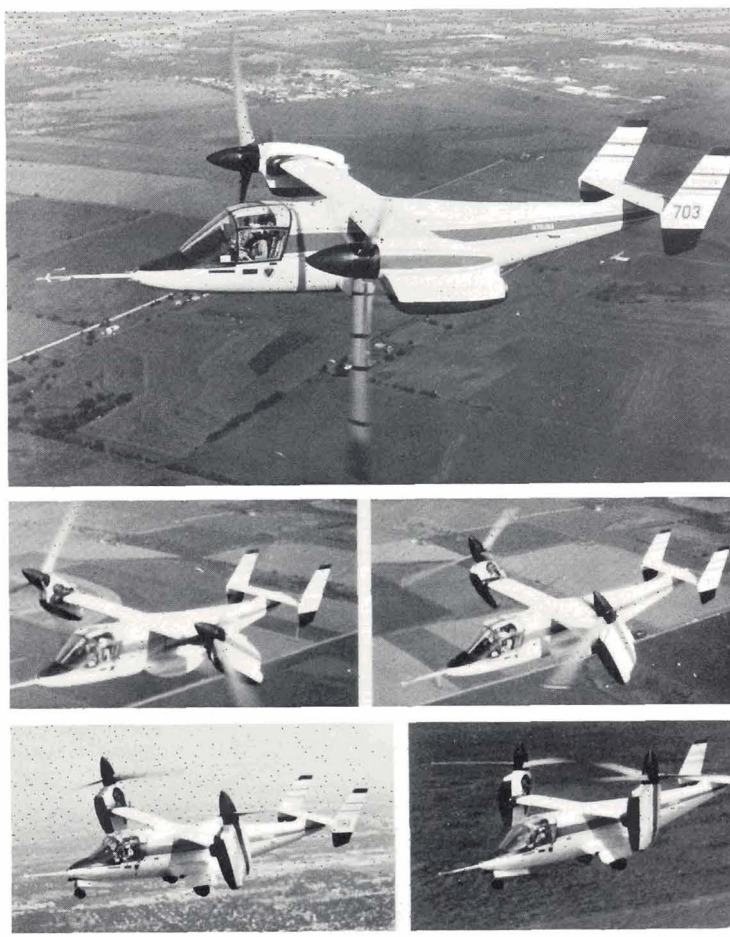
Bell Helicopter Textron's experimental XV-15 tilt rotor aircraft recently completed its longest cross-country flight when it took off from the NASA Ames Research Center in California and headed toward Bell's Flight Research Center in the Fort Worth, Texas, area. The flight covered about 1,600 miles in 6¼ flight hours.

The XV-15 program was initiated in 1972 as a joint Army and NASA research program. The Navy provided additional funding in 1979 and 1980 to accelerate testing and permit earlier evaluation of the concept for potential Navy/Marine applications.

During the contractor test program at Bell, which concluded in August 1980, the XV-15 made approximately 100 full conversions from helicopter to airplane mode. It also achieved a forward flight speed of 301 knots (346 mph) to exceed an unofficial world's speed record for rotorcraft.

Benefits of the tilt rotor are derived from its ability to combine the efficient, precise hover and vertical takeoff and landing (VTOL) characteristics of the helicopter with the speed, range, and endurance of the turboprop airplane. A VTOL terminal requires far less land area than needed for conventional flight and can be located closer to population centers. For military use, the tilt rotor can combine the utility of helicopters with the advantages of longer-range, higher-speed transport aircraft. The XV-15 cruise speed is approximately 300 knots, twice as fast as present helicopters. It is also much quieter than today's helicopters and turboprop airplanes.

The tilt rotor aircraft will remain at the Bell facility for about 2 years during which time it will be available for government testing.



The XV-15 tilt rotor aircraft converts from airplane to helicopter mode by a change in propeller position.

MULE MARINE CORPS TESTS SUCCESSFUL

A laser device that sends an invisible beam to pinpoint targets for laser-guided weapons and conventional artillery has successfully passed rugged operational tests conducted by the US Marine Corps. The manportable, tripod-mounted device, called Modular Universal Laser Equipment (MULE), was evaluated under simulated combat conditions at the Marine Air-Ground Combat Training Center in Twenty Nine Palms, California.

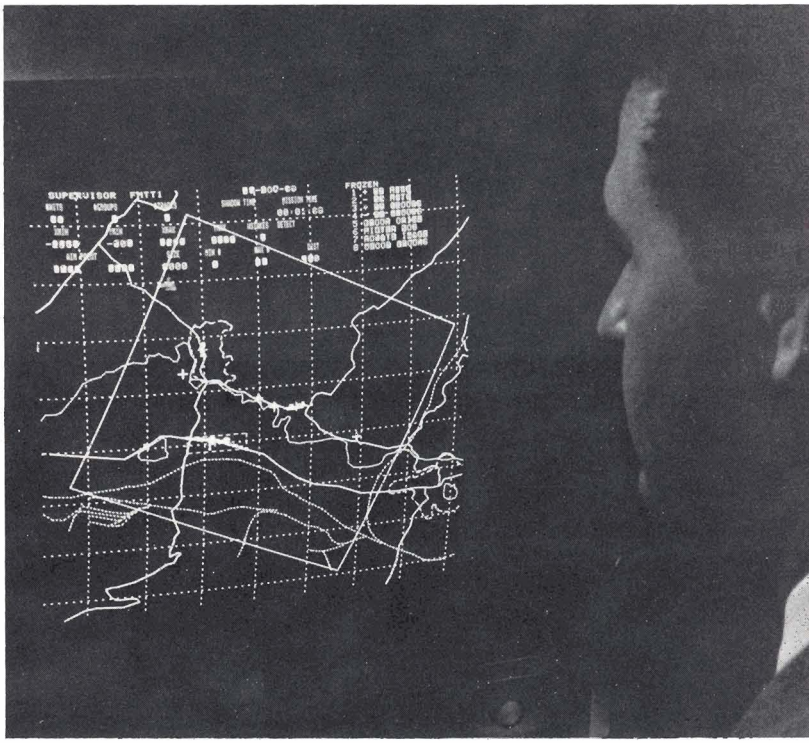
During the tests, MULE successfully designated targets for Copperhead (a developmental 155-mm, laser-guided, artillery projectile) and the Hellfire laser-guided missile. Flying low over the desert base, Marine aircraft equipped with laser spot trackers located and identified targets designated by MULE operators.

A US Marine sights a target with the MULE during recent operational tests of the laser device.

The Marine Corps tests were designed to evaluate MULE's reliability and durability, and to develop initial doctrine and tactics for its use. Ten engineering development models of MULE have been delivered to the Marines under a contract managed by the US Army Missile Command. Designed for use by forward observers, the device can designate targets for all laser-guided weapons now operational or under development.

NEW RADAR DISPLAY USES FULL COLOR

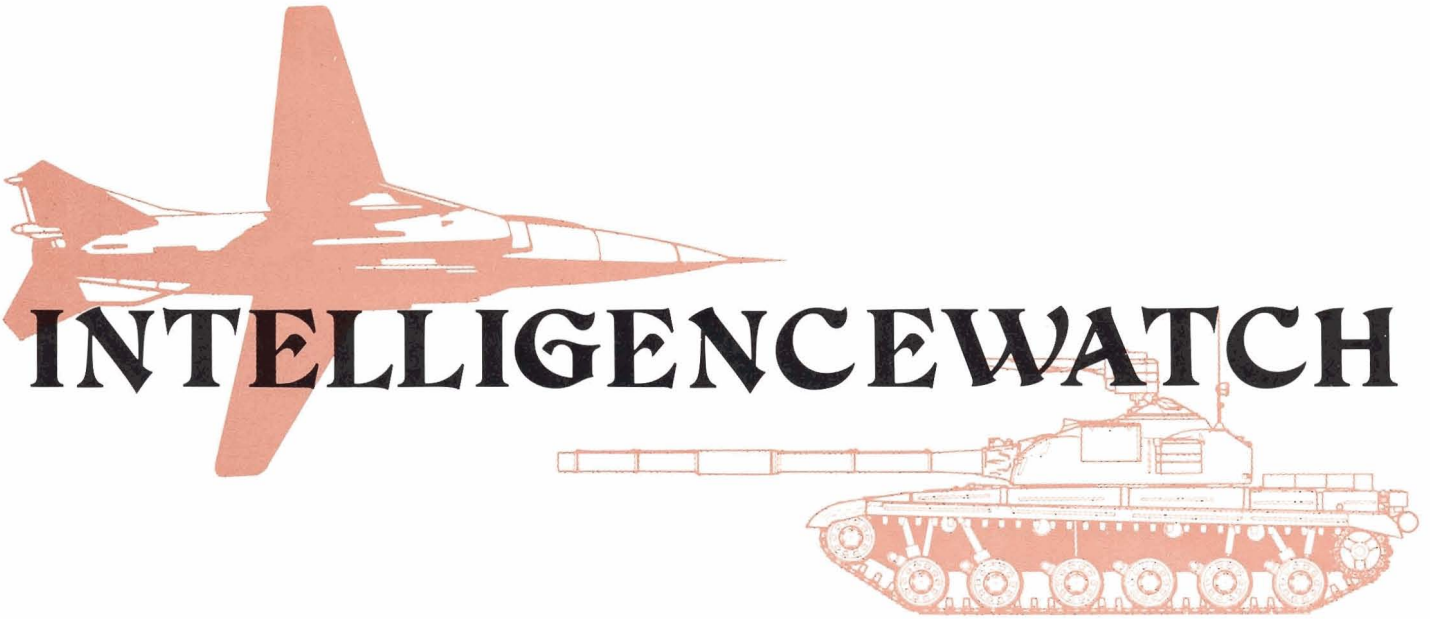
A new system using standoff airborne radar to detect and track massed armor and other forces can display these targets and their movements in full color on a cartographic base that shows roads, railroads, airfields, and rivers. This system, called Pave Mover, can display as many as 4,096 hues.



The Pave Mover system displays targets and terrain features in full color.

Pave Mover uses airborne radar to relay target information via data link to a mobile, ground-based data processing control station (DPCS). Computers in the DPCS process the information and display the target data. Pave Mover's radar—which consists of a long-range, all-weather, sidelooking, electronic-scanned array radar—also can guide missiles or tactical aircraft to designated targets. Guidance commands and targeting information are supplied by the DPCS.

The Pave Mover system is part of a broader Assault Breaker Program for neutralizing enemy armor before it reaches the forward edge of the battle area. The system is being developed by Hughes Aircraft Company's Radar Systems Group under contract from the US Air Force's Rome Air Development Center and the Defense Advanced Research Projects Agency. The Air Force is evaluating Pave Mover at White Sands Missile Range, New Mexico.



INTELLIGENCEWATCH

GERMAN NAVY REVIEWS FLYCATCHER

In August 1981, the air defense weapon control system called Flycatcher was demonstrated for officials of the West German navy at the naval air base in Eggebek, Germany.

The German navy constantly surveys possibilities of modernizing the air defense of vulnerable assets by using the newest weapon control systems available. Hollandse Signaalapparaten and Contraves, both of Switzerland, were invited to demonstrate the capabilities of their systems. The trials were aimed at detection and tracking of targets flying various attack profiles (including those from very low levels) and the ensuing control of Bofors 40-mm guns. Both helicopters and fighters were employed to execute single and multiple attacks.

The experts present showed great appreciation for the performance of the Flycatcher, especially for its reaction speed and low-level tracking capabilities.

—*Signaalflash*

A Flycatcher is demonstrated for the West German navy.

CORRECTION

The July-September 1981 Intelligencewatch contained an error in the article titled "Antishipping Missile Defense." The maximum rate of fire for the Goalkeeper system was given as 600 rounds per minute. The actual rate of fire is 4,200 rounds per minute.

WEST GERMAN TOW FIRINGS

West German BO-105 CB helicopters have joined a variety of helicopters to be equipped with the airborne TOW antitank missile system.

Tests were held recently at the West German armed forces' firing range at Meppen where 11 missiles fired scored 100-percent hits. The firings covered the complete flight envelope up to the test range limit of 3,200 meters.

The TOW antitank missile system has been deployed with the air and ground forces of 33 countries, including 10 NATO nations.

SWITZERLAND ORDERS RAPIER

Switzerland has ordered the Rapier antiaircraft (AA) system from Great Britian. The order, which consists of 60 trailer-mounted launchers with the appropriate all-weather radar system BLINDFIRE, is valued at 1,192 million Swiss francs. Thirty percent of the equipment will be built in Switzerland . The delivery dates are between 1984 and 1987.

The Swiss army chose the Rapier AA system for protection of its armored and mechanized units against low-flying aircraft.

—*Soldat und Technik*

FORT BLISS — An Illustrated History,
by Leon C. Metz.
Mangan Books, 6245 Snowheights, El Paso, Texas 79912. 180 pages, $34.95.

This fabulous new book has just been released and is a crowning achievement for the author, a renowned Southwest historian. Also a popular lecturer on gunfighters and western military history, Metz is assistant to the president of the University of Texas at El Paso.

The book includes 16 chapters, beginning with an account of the early Europeans and badmen who came to the area and winding on to the days of the Post of El Paso (later Fort Bliss), which was founded January 11, 1851. From there, the story carries through border skirmishes with Mexico in horse cavalry and Poncho Villa days, on to World Wars I and II, and up to today — including accounts of Biggs Air Force Base and William Beaumont Army Medical Center. More than 150 pictures, maps, and specially commissioned art (on oversize pages) vividly illustrate the story from beginning to end.

In the first few chapters of the book, the author captures the excitement of the Old West and weaves the historical threads of early Fort Bliss into the colorful, historical fabric of that era. Every paragraph is loaded with information. Literally hundreds of little-known, fascinating facts appear and are presented in a smooth-flowing, logically arranged style; facts that completely absorb the reader's interest. The reader finds himself in the midst of what is happening.

The Post of El Paso became the original Fort Bliss on March 8, 1854, and was named after LTC William Wallace Smith Bliss, son-in-law of President Zachary Taylor. Although name changes occurred, final determination was made in July 1879 and Fort Bliss became the permanent name of the post. All that history has recorded about the post is colorfully described in the book — from the days of weapons, such as sawed-off muskets that had a tendency for the ball to fall out when the muzzle was pointed down, to today when modern missiles shriek into the sky over Fort Bliss ranges.

A full chapter is devoted to the role Fort Bliss played in the Civil War, including acts of important men whose names now appear on street signs in El Paso. Actions involving Poncho Villa, General Pershing, General Scott, and many other American and Mexican leaders (and people on both sides of the border) are described in an exciting chapter on border trouble.

Fort Bliss is an unprecedented research document on the historical aspects of the post and its environs. Accounts in the book connect old sites to current sites and establishments familiar to soldiers and civilians who now man those establishments, thus giving one a sense of association with history.

This book ends a constant struggle for those trying to find a complete history of Fort Bliss. A chapter is also devoted to White Sands Missile Range, New Mexico, which has a strong link to Fort Bliss military and scientific activities and is one of the nation's most important testing grounds.

Both the old soldiers who somehow figured in the history of Fort Bliss and people more recently connected with the post can look upon this book as a monument to their service, and military history devotees will find it a genuine treasure.

THE LUFTWAFFE IN THE BATTLE OF BRITAIN,
by Armand van Ishoven.
Charles Scribner's Sons, New York, 1980. 128 pages, $19.95.

The author, a Belgian historian who specializes in German history of the 1918-1945 period and an acknowledged expert on the Luftwaffe, has compiled a fascinating book on the air battle over Britain. The text is composed principally of actual reports by pilots and propaganda reporters, along with interviews from former German pilots and their relatives.

Extensive photography of the period is used to illustrate the text. The author should be complimented for this massive compilation and the skillful way in which he has minimized his own verbiage and allowed the photos and accounts to speak for themselves. It is a most interesting tale they tell.

This is perhaps the first telling of the Battle of Britain through the eyes of the enemy: the Luftwaffe pilots, who battled English interceptors, and the German bomber pilots, who unleashed tons of bombs upon English towns and cities.

Some of the interesting chapter headings include: Dodging the Balloons, Fighter Cover to Portsmouth, Stukas against Radar Stations, Low-Level Attack, Sinking the *Empress of Britain*, Bailing Out at Night, and Bombing Coventry. The last chapter, appropriately titled

Last Victim of the Baby Blitz, ends with a photo of the tombstone of Hauptmann Richard Paul, the last German pilot to die in the last battle in the air war over England. He never reached his 24th birthday.

LTC Stanley R. Sludikoff

SOVIET MILITARY POWER,
Department of Defense, Superintendent of Documents, US Government Printing Office, Washington, DC 20402. $6.50.

This booklet made national headlines upon its release. Time magazine titled its article, "Throwing the Booklet at Moscow," while the Christian Science Monitor called it the "Pentagon's Soviet Primer." The Soviet news agency TASS immediately labeled the report a "colorful booklet" and accused the Pentagon of attempting to "confuse, intimidate, and misinform public opinion in the West." TASS further claimed that Secretary of Defense Caspar W. Weinberger was "gushing a barrage of irresponsible verbiage."

Soviet Military Power is a 99-page look at the Soviet armed forces. The need and purpose of the book are spelled out upfront by Weinberger, who declares, "a clear understanding of Soviet armed forces, their doctrine, capabilities, strengths, and weaknesses is essential to the shaping and maintenance of effective US and allied armed forces."

Compiled by the Defense Intelligence Agency, the booklet is well illustrated with artists' conceptions, maps, graphs, and photographs depicting Soviet weapons, manpower, industrial capabilities, and worldwide military expansion. Time magazine called the report the largest and most comprehensive release of unclassified intelligence data in the Pentagon's history.

While the booklet contains no new or startling disclosures, it does provide a comprehensive guide to the growth of the Soviet armed forces and the emphasis placed on Soviet military buildups and expansion throughout the world.

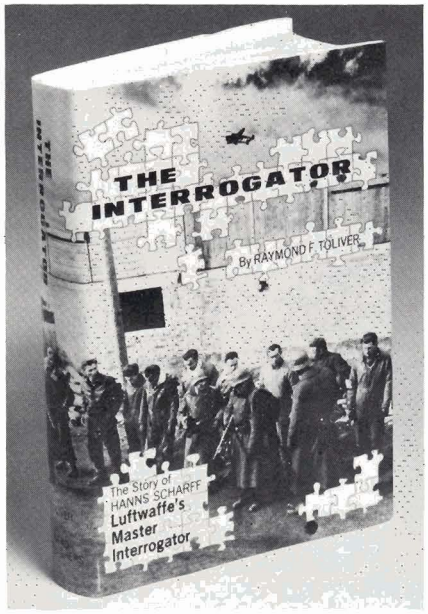
Areas discussed include Soviet military power, military resource allocation, organization of Soviet armed forces, Soviet theater forces, Soviet strategic forces, the Soviet quest for technological superiority, Soviet global power projection, and the challenge of Soviet arms.

The booklet should be required reading for all military personnel.

Weinberger noted, "There is nothing hypothetical about the Soviet military machine. Its expansion, modernization, and contribution to projection of power beyond Soviet boundaries are obvious."

Outlining Soviet advances in modern warfare, including laser weapons and space warfare, the booklet paints a quick, concise picture of the Soviet threat to world peace. The book is written in easy to understand language and superbly illustrated.

The booklet is being distributed down to battalion level units through military intelligence channels. It is also available through the superintendent of documents.



THE INTERROGATOR,
by Raymond F. Toliver.
Aero Publishers, Inc., 329 W. Aviation Road, Fallbrook, CA 92028, 1981. 350 pages, $12.95.

This is the true story of Hanns Joachim Scharff, the master interrogator of fighter pilots captured by the Germans in World War II. This Luftwaffe intelligence officer gained a reputation among his contemporaries, superiors, and with Hermann Göring himself as the man who magically was able to get the answers he had to have from captured Allied fighter pilots.

The magic spell cast by Hanns Scharff made prisoners talk, even though they were conditioned to remain silent. His methods broke down barriers so effectively that after the war the US Air Force invited him to lecture senior officers at the Pentagon on prisoner of war interrogation.

The Interrogator reveals facts about Scharff 's technique that are of great interest to anyone in the service.

CONQUEST AND OVERLORD,
by Brian Jewell.
Arco Publishers Inc., 219 Park Ave S., New York, NY 10003. 50 pages, $19.95.

This book tells the story of two great cross-channel invasions: the Norman Conquest of England in 1066 and the Operation Overlord invasion of Europe in 1944. Bayeux Tapestry* and Overlord Embroidery are used in the book as background to historical accounts of the campaigns.

The Bayeux Tapestry tells the story of the French invasion and defeat of England in 1066 by William the Conqueror. Historically, it is beyond price because its long, elegant lines, glowing colors, and gold embroidery are the sole complete record of that war: its weaponry, regalia, battle formations of foot soldiers and mounted knights, and the behind-the-scenes plottings and betrayals.

The Overlord Embroidery shows the invasion of France by England and its allies, which led to the defeat of the Axis powers. The landing is forcefully portrayed in a series of panels. The men and women who planned that landing, the armament used, and the battles that resulted are all colorfully embroidered in a tapestry that owes its

conception to the Bayeux.

The two stand side by side as commemorative works, depicting the struggles and sacrifices of war. Both are triumphs of artistic form, recording events that forever changed the course of history.

*Named after the ancient Norman city of Bayeux where the tapestry was woven in 1067.

A SHORT HISTORY OF WORLD WAR II,
by James L. Stokesbury.
William Morrow and Co., Inc., New York, 1980. 420 pages, $15.95.

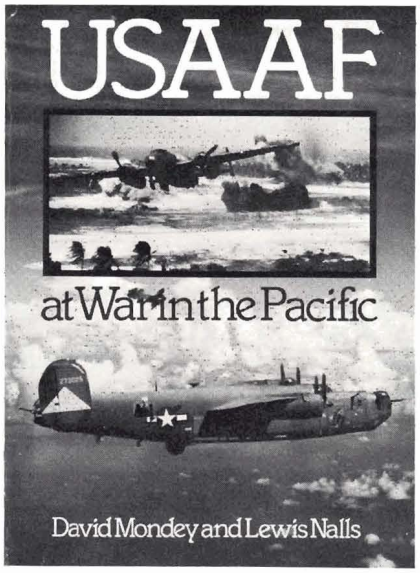
The title suggests the objective of this book by James L. Stokesbury, professor of history at Acadia University. Attempting to tell the story of the many complexities of WW II is indeed a formidable task. The author provides the background and events leading to the conflict, carries the reader through the major arenas of combat, and ends with the defeat of Japan.

He devotes the final chapter to a concise analysis of the real results of the war. Stokesbury points out that the free countries managed to stamp out the evil of Hitlerism. Yet that very victory created problems for the next generation such as new power vacuums, the US/USSR confrontation, and the loss of an independent Poland.

Although well-written, thoughtful, and entertaining, the author's maps are inadequate for a reader interested in the military aspects of the war. Some of his facts are inaccurate. Stokesbury claims that the US Army had but 110,000 men in 1936. But the Army consisted of more than 166,000 including almost 17,000 in the Air Corps. In describing the results of the Polish-Russian War of 1920 he writes, "A French military mission helped the Poles keep the Russians away from Warsaw . . ." In reality the Poles crushed invading Soviet forces and extended their border close to Minsk in western USSR.

Despite minor flaws this is a book worth reading because Stokesbury neatly connects the military, political, and historical aspects of the war into a single package. Many readers will agree with his conclusions but they are cautioned not to indiscriminately accept all facts presented.

Joseph P. Frankoski
LTC, USA (Ret)



USAAF AT WAR IN THE PACIFIC,
by David Mondey and Lewis Nalls.
Charles Scribner's Sons, New York, 1980. 160 pages, $22.50.

Beginning with the Japanese attack on Pearl Harbor, and culminating with the dropping of the atomic bombs and the ultimate surrender by Japan on the *USS Missouri,* this book presents the contribution of the US Army Air Force (USAAF) in the Pacific during World War II.

In the introduction to the book, the authors point out that the contribution made by the USAAF was so great that it cannot be covered in any detail in one volume. Yet an excellent job has been done in presenting this time in history that began with such bleak and desperate hours and ended with overwhelming superiority over the enemy. The authors also state that it is difficult to study in isolation the work of the USAAF since it was so closely tied to that of the US Navy, Marine Corps, and the Royal Australian Air Force. This difficulty is evident throughout the pages of this book. However, it is appropriate to study the Army Air Force in the Pacific in isolation to bring to light the outstanding contributions it made in World War II.

Usually, when one thinks of air power in Europe, the USAAF immediately comes to mind in the form of B-17s, B-24s, P-47s, P-38s, B-25s, B-26s, A-26s, and many more aircraft, better known for their exploits in Europe than in the Pacific. It is the fast carrier task forces (the Hellcats, Wildcats, Corsairs, Dauntlesses, Avengers, and Helldrivers) that come to mind when one thinks of US air power in the Pacific. The USAAF contribution was quite significant, but except for the B-29 raids on the Japanese homeland during the last year of the war, comparatively little has been written that deals specifically with the Army Air Force. That is what makes this book particularly worthwhile and interesting.

Although there are some technical and historical errors sprinkled throughout the book, it is an excellent combination of narrative, photographs, and captions that will leave the reader with a comprehensive understanding and appreciation of the efforts of the USAAF in the Pacific. Chapters include coverage of the attack on Pearl Harbor, the early days of the war, Guadalcanal, the China-Burma-India Theatre, and more. The personal side of the men, the maintenance side of the aircraft, and the operations flown by these men and machines are looked at to cover all the aspects of this wartime effort. Certainly one of the better works available on the subject, *USAAF at War in the Pacific* is recommended reading for World War II, and other, aviation buffs.

VIETNAM FROM CEASE-FIRE TO CAPITULATION,
Department of Defense, Superintendent of Documents, Government Printing Office, Washington, DC 20402. 180 pages, paperbound with maps and index, $5.50. GPO stock number: S/N 008-029-00120-9.

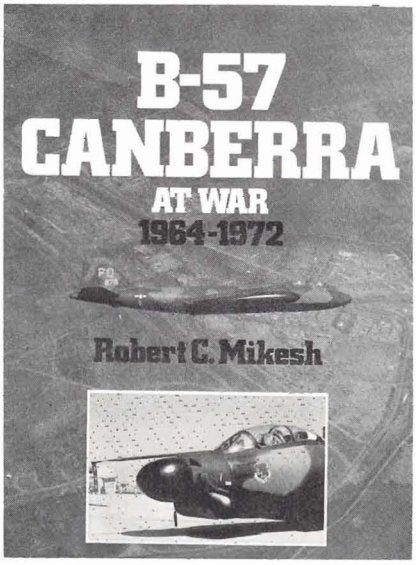
Here is a detailed account of the last 3 years of the war in Vietnam by COL William E. Le Gro, a senior US Army staff officer and one of the last Americans to leave Saigon. This publication covers military developments and social and economic conditions affecting the war effort. The author also examines some aspects of US politics, reduction of American supplies, and declining morale in the South Vietnamese army. "The outcome could have been different," concludes the author. "Unit for unit and man for man, the combat forces of South Vietnam repeatedly proved themselves superior to their adversaries. Missing, however, were inspired civil and military leadership at the highest levels and unflagging American moral and material support.

ARMS CONTROL II - A New Approach To International Security,
Edited by John H. Barton, Stanford University Law School, and Ryukichi Imai, Japanese ambassador to Kuwait.
Oelgeschlager, Gunn, and Hain, Inc., 1278 Massachusetts Ave., Harvard Square, Cambridge, MA 02138, 1981. 352 pages, $27.50.

Arms Control II discusses the limitations of traditional arms control and considers new regional and technological issues affecting arms controls. It proposes a new diplomatic agenda for reducing weapon increases and meeting security concerns in a world shaped by economics, technology, and domestic political evolutions.

The book contains the following separate writings on the subject of "Why Arms Control II?"written by various authors:

- Introductions: Arms Control in a Changing World, Ryukichi Imai.
- A Review of Arms Control in the Postwar Period, Atsuhiko Yatabe.
- Arms Control: Do the Costs Outweigh the Benefits? Henry Rowen.
- The Politics of Regional Arms Control, John H. Barton.
- Advancing Technology and Its Implications for the Identity of Arms Control, Ryukichi Imai.
- Economics, National Security, and Arms Control, Henry R. Nau. II, Asian Case Studies.
- Korea and Arms Control II, Franklin B. Weinstein.
- The Future of Arms Control in Southeast Asia, Masashi Nishihara.
- Future United States-China Relations: The Taiwan Factor, Victor H. Li.
- China's Quest for Technology: Implications for Arms Control II, Thomas Fingar.
- Arms Transfers: The Japanese Calculus, Daniel I. Okimoto.
- Arms Control II: New Directions, John H. Barton.



B-57 CANBERRA AT WAR, 1964-1972,
by Robert C. Mibesh.
Charles Scribner's Sons, New York. 160 pages, $17.95.

Robert C. Mibesh spent 2,000 hours in the cockpit of the B-57 and is now curator of aircraft at the Smithsonian Institute's National Air and Space Museum in Washington, DC. His book on the B-57 is undoubtedly the most comprehensive and outstanding work on this important aircraft ever published.

In the early 1950s the US Air Force was in the market for a new light bomber that would have good night interdiction capabilities. Since the aircraft was needed in short order, it was to be based on an existing design. The Martin XB-51, North American B-45 and AJ-1, Canadian CF-100, and British Canberra were all evaluated. The British aircaft easily won the competition and thus began the historical development that changed the aircraft to the American B-57.

Little has been written about Canberras and B-57s in foreign services, and here again this book proves its worth with coverage of Australian, Chinese, Vietnamese, and Pakistani use of the aircraft. However, the most interesting part of the book to this reviewer was the part concerning the big wing conversions. These impressive looking aircraft have been used for reconnaissance and weather sampling duties, as well as for research by NASA. Both the RB-570 and the General Dynamics R/EB-57-F are covered in this book.

In short, there seems to be nothing about the B-57 that this excellent publication does not tell you. Well written and illustrated with photos, drawings, and charts, this book is an absolute must for the combat aviation enthusiast.

ADDITIONAL SELECTIONS

These excellent books on aircraft, published by Charles Scribner's Sons, 597 Fifth Avenue, New York, NY 10017, are interesting reading, and are loaded with outstanding pictures:

Stuka at War, 128 pages, $19.95.
F4U Corsair at War, 160 pages, $10.95.
F-105 Thunderchief, 112 pages, $17.95.
F-104 Starfighter, 112 pages, $17.95.
B-52 Stratofortress, 128 pages, $17.95.

Senior Air Defense Artillery Commanders

MG William E. Cooper, Jr.
32d AADCOM

COL Norman E. Jarock
10th ADA Group

LTC Vance L. Turner
1st Bn, 1st ADA (Hawk)

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

LTC Michael J. Lanpher
3d Bn, 59th ADA (Hawk)

COL Donald R. Infante
69th ADA Group

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

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

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

LTC Andrew L. Jackson, Jr.
3d Bn, 60th ADA (Hawk)

COL William F. Winzurk
94th ADA Group

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

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

LTC William M. Arrants
2d Bn, 56th ADA (Herc)

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

COL Domenic P. Rocco, Jr.
108th ADA Group

LTC Leroy Woods
6th Bn, 56th ADA (C/V)

LTC Vernon L. Conner
2d Bn, 60th ADA (C/V)

LTC Donald E. Nowland
2d Bn, 62 ADA (Hawk)

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

LTC Jay M. Garner
2d Bn, 59th ADA (C/V)
1st Armd Div

LTC James J. Cravens
3d Bn, 61st ADA (C/V)
2d Armd Div

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

LTC Richard N. Murray
1st Bn, 59th ADA (C/V)
8th Inf Div

LTC Brian Flynn
5th USA Arty Group
59th Bde

COL Richard J. Galliers
559th USA Arty Group

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

LTC Frederick P. Weichel, Jr.
2d Bn, 71st ADA (Hawk)
2d Inf Div

LTC Dale L. Simpkins
1st Bn, 62d ADA (C/V)
25th Inf Div

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

LTC Jerry W. Felder
3d Bn, 4th ADA (C/V)
82d Abn Div

LTC Vincent J. Tedesco, Jr.
1st Bn, 3d ADA (C/V)
101st Abn Div

LTC Paul M. Vilog II
2d Bn, 5th ADA (C/V)
3d Armd Div

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

LTC Martin R. Hurwitz
2d Bn, 51st ADA (Hawk)
1st Inf Div

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

LTC Edgar L. Wylie
1st Bn, 51st ADA (C/V)
7th Inf Div

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

LTC John B. Rogers
1st Bn, 4th ADA (Hawk)

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

LTC Richard V. Lowe
5th Bn, 52d ADA (C/V)
24th Inf Div

As of 1 March 1982

COL Gerald H. Putman
11th ADA Brigade

LTC Russell I. Moore
4th Bn, 1st ADA (C/V)

LTC James M. Moye
1st Bn, 7th ADA (Hawk)

LTC Irvin S. Butler, Jr.
2d Bn, 55th ADA (Hawk)

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

LTC James H. Cook
1st Bn, 65th ADA (Hawk)

COL Travis N. Dyer
The School Brigade

LTC James G. Manning, Jr.
1st Bn, 43d ADA (Patriot)

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

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

MAJ (P) Glenn R. Love
Allied Student Bn

LTC T. J. Camp
Staff & Faculty Bn

LTC Gerald J. Dunn, Jr.
Student Bn

COL Edmond S. Solymosy
1st ADA Tng Bde

LTC Robert B. Tinsman
3d ADA Tng Bn

LTC William R. Causer
4th ADA Tng Bn

LTC Lawrence Anderson
Instructor Group

BG Herbert Taylor
111th ADA Bde, NMARNG

LTC Donald Tarringer
1st Bn, 200th ADA, NMARNG

LTC Miguel Fretze
2d Bn, 200th ADA, NMARNG

LTC Lawrence Lujan
3d Bn, 200th ADA, NMARNG

LTC Albert Bach
4th Bn, 200th ADA, NMARNG

LTC Albert G. Jones
3d Bn, 111th ADA, VARNG

LTC Andrew J. Regrut
2d Bn, 174th ADA, OARNG

LTC Hoyt E. Thompson
2d Bn, 263d ADA, SCARNG

LTC James S. Irwin
1st Bn, 265th ADA, FLARNG

☆ U.S. GOVERNMENT PRINTING OFFICE: K5002/1761-S — 1982