AIR DEFENSE MAGAZINE

APRIL - JUNE 1980

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AIR DEFE

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AIR DEFENSE

"The Bridge over the Chasm of Defeat."

Editor
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JUSTIN R. ORMSBY

COVER:

A Designating Optical Tracker is launched from the US Army's Kwajalein Missile Range in the South Pacific. This colorful picture was furnished to the Air Defense Magazine by LTC Martin G. Olson who has served as Deputy Commander of Kwajalein Missile Range.

ENSE
MAGAZINE

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AIR DEFENSE Magazine is 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.

Distribution will be made only within the School, except for distribution on a gratuitous basis to Army National Guard and USAR schools, Reserve component training and ROTC facilities, and as requested by other service schools, CONUS armies, Active Army units, major oversea commands, and military assistance advisory groups and missions.

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Articles and letters should be addressed to: The Editor, AIR DEFENSE Magazine, USAADS, ATTN: ATSA-TD-DLS, Fort Bliss, Texas 79916.

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

Subscriptions may be obtained through the Custodian, US Army AIR DEFENSE Magazine Fund, USAADS, ATTN: ATSA-TD-DL, Fort Bliss, Texas 79916. The rate is $4.00 per year. Make checks payable to: Treasury of the United States.

Controlled Circulation postage paid at El Paso, Texas. (USPS 307-010)

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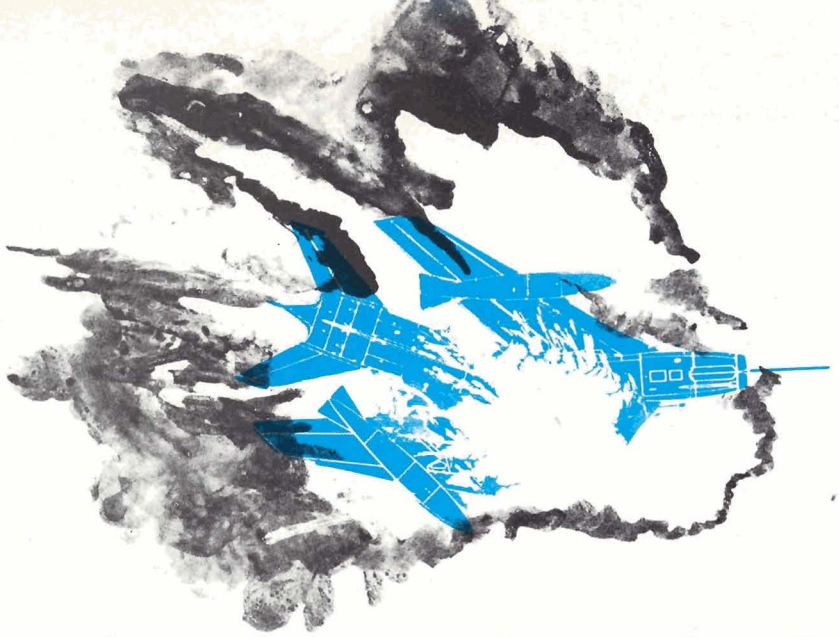


INTERCEPT P

MAJOR GENERAL JOHN B. OBLINGER, JR.

In this Intercept Point article, I am drawing upon some remarks I made at the close of 1979 during a retirement ceremony at Fort Bliss that coincided with the inauguration of the Army's observance of the "Need And Value Of Service To Country." The season of the year took on added significance because not only were families drawing together in the spirit of Christmas, they were also sharing the anguish of 50 very special American families--the families of the hostages in Tehran. We are still unified today in that sense of anguish, and that unfortunate situation in Tehran has also caused us to draw closer together as a nation and to take a closer look at those who are serving our country.

We join in a salute to those who serve our nation during this special time. This accolade was highlighted on 22 December 1979 at the Sun Bowl in El Paso, Texas, when General of the Army Omar N. Bradley was presented with the Defense Distinguished Service Medal. I can think of no finer citizen and soldier to represent those men and women who have served, are serving, and will serve in the Armed Forces of this nation than General Bradley. We are proud and honored to have General Bradley with us in the Fort Bliss-El Paso community.

Likewise, we at Fort Bliss are proud and fortunate to have El Paso as a neighbor and, even more importantly, a friend. The city of El Paso is truly a patriotic community. No other city in the nation is more aware of what service to the nation, national pride, and patriotism mean. Patriotism is a daily way of life in the Sun City, not an item that is brought out of the closet only when it becomes the "in" thing to do. Proof of this patriotism and close cooperation is evidenced in the proclamation issued by the Honorable Thomas Westfall, Mayor of the city of El Paso, that marked the week of 17 December to 22 December 1979 as Service to Nation Week in El Paso. As we observed that week, we noted that service has been the byword of the US Army and the citizens of this country for more than 200 years.

Thomas Paine said that the 1770s were the times that tried men's souls. At that time our nation was fighting for its very survival. Today--200 years later--the times are no less trying. True, we're not fighting on a battlefield, but we are struggling for the survival of American interests in a much more complex arena than Thomas Paine could have ever imagined. The challenge we face today is as great as any we've seen in the past. Our national security hinges on events that occur in the farthest corners of the world. And yet, our strength today is tied to the same common denominator as it was 200 years ago when George Washington said, "If we desire peace. . .it must be known that we are at all times ready for war."

At this moment, some 760,000 American men and women stand ready around the world. They are soldiers of the active Army. They stand guard in Alaska in subzero temperatures and howling blizzards. They man the observation posts

overlooking the barren emptiness of the demilitarized zone in Korea. They serve at Checkpoint Charlie in West Berlin, looking across a wall that has slowed, but not stopped, the flight of those in East Germany who desperately seek freedom. And they do all this voluntarily because their nation needs them.

Also serving our country are more than 500,000 soldiers in the Army National Guard and Army Reserve. These are citizen soldiers. Their heritage is that of the militia who responded to Paul Revere's call to arms in April 1775. Their past is Valley Forge, the trenches of World War I, and the beaches of World War II. They are equal partners in today's total Army. They provide an essential part of our combat strength. Many of them are businessmen and women, teachers, and even students here in El Paso.

These men and women of the total Army know the need and value of service to their country. We all know, but often need reminding, that service is the foundation of our democratic heritage. It's an honor as well as an obligation. Our freedom depends on it today just as much as it did in the past. But today, as in the past, we face also the challenge of complacency. It's too easy to forget the lessons of history.

The United States was founded by patriots who put aside their personal ambitions to work for what was only a vision at the time--a free and independent nation. Today that vision is a reality, but to keep it so--and to improve it--we must always be prepared to serve and preserve it.

The soldiers who were honored at that retirement ceremony have done their share, and more. Their families have, too. They have shared the triumphs and setbacks. They have felt the loneliness of separation and the anguish of waiting. Now, happily, they share the beginning of a new life.

In expressing my thanks to the soldiers who participated in the review, I was mindful of the many units who have participated in previous retirement ceremonies, honoring the thousands of loyal soldiers who have gone before. On this occasion, the units represented included The School Brigade, the 3d Armored Cavalry Regiment, the 11th Air Defense Artillery Group, and the 70th Ordnance Battalion. All the participating troops were outstanding examples of those young Americans who still see service to a nation as a challenge and a necessity. The 62d Army Band, which is a constant ingredient in our many ceremonies at Fort Bliss, was further evidence of pride, dedication, and service.

Now, I wish to reiterate the thanks I expressed to the many friends from El Paso who joined us that day as they have so often before and since. They are what we are serving for. They are the embodiment of the patriots who made America what it is today--a strong and proud country, ready to continue to hold its rightful place in the world today.

John B. Oblinger

ENGAGEMENT ZONE

Dear Sir:

The article about the 5th USA Artillery Group (AD) and the letter on "Custodial Commands" in the Jul-Sep 79 issue of the AIR DEFENSE Magazine really struck home for me.

I am assigned to Team D of the 52nd USA Artillery Detachment in Giessen, Germany. Without a doubt, commanding a custodial team is a highly responsible yet thoroughly gratifying tour of duty. Young officers spend 2 years learning the complexities of running an installation before a command assignment is given to them. After all, the security and tactical mission required of each team, along with the responsibility of maintaining friendly relations with the host community, are vital to the national defense and security of the United States.

At Team D, we feel that working at an isolated outpost is very rewarding. Both officers and NCOs have the opportunity to develop leadership styles and problem solving techniques that are their own. I can't think of a better way to become equipped to handle future responsibilities.

JOHN D. BLALACK
1LT, ADA
Team D, 52nd USA
Artillery Detachment
APO NY 09169

Dear Sir:

I am writing in reference to the article on "AD Battle Simulation" appearing in the Developments section (pages 55-56) of your October-December 1979 issue. As the ADA Command Controller of the 75th USA Maneuver Area Command (USAR), I am responsible for air defense play in the CPXs conducted by our unit for various National Guard divisions and brigades. I am interested in obtaining the "Raider" air defense battle simulation model to help us achieve our training objectives when we conduct exercises. Your assistance in this matter would be appreciated.

JAMES G. SKELLY
LTC, ADA, USAR
330 Wycliffe
Houston, Texas 77079

Many inquiries have been received concerning this article (which also appeared in the December issue of the AD Bulletin). Additional information about the subject can be obtained by writing to MAJ Stephen White or SFC George Istok, HQ and HQ Btry, 4th Bn, 61st ADA (Gp) (Prov), Fort Carson, CO 80913.

-Ed.

Dear Sir:

I wish to thank you for your graphic display of Sustaining Bases (ADA FORSCOM Units) on the cover of the January-March 1980 issue of the AIR DEFENSE Magazine. But you have left me with some misgiving as to the location of my unit, 1st Battalion, 68th ADA, better known as the LOLAMY.

The map shows the 1st of the 68th in the Fort Bragg area of North Carolina. To my knowledge the 3d Battalion, 4th ADA, was located there and the 1st Battalion, 68th ADA, was collocated with the 2d Battalion, 5th ADA, at Fort Hood, Texas.

My questions are: Are these the past locations of the units shown? Are these the future locations of the units shown? To these questions I would greatly appreciate an answer.

SSG MOFFAT A.C. GARDNER II
HHB 1st Bn, 68th ADA
1st Cavalry Division
Fort Hood, Texas 76545

Our answer to your inquiry is included in my comment following the next letter.

-Ed.

Dear Sir:

I don't believe it! I refer to the cover of the January-March 1980 issue of AIR DEFENSE. The cover depicts the unit crests of the "combat soldiers of the ADA FORSCOM units who stand ever ready to plunge into action in defense of our nation."

Holy Hercules! You've omitted the largest (over 1150 soldiers) ADA battalion in FORSCOM, a

battalion that performs not only a FORSCOM contingency mission but is also THE sustaining base for all Nike Hercules MOSs worldwide. Notwithstanding that the 2d Battalion, 52d ADA is garrisoned at far-off McGregor Range, the Battalion is alive and well. How could our own Branch magazine make such a glaring error. Gads!

Please make it up to those soldiers who are so dedicated to providing a combat-ready, deployable Nike Hercules battalion in support of FORSCOM deployment plans. As the only Nike Hercules battalion in CONUS, we are proud of our 5,000 fellow Nike Hercules soldiers in the 94th ADA Group in Europe as well as around the world. Thanks for your support.

DAVID G. HANSEN
LTC, ADA
Commander
2d Battalion, 52d ADA

Lean back and relax. You'll have to read a while if you intend to follow this explanation. LTC Hansen's and SSG Gardner's comments are typical of those we've received regarding this cover, so we're publishing theirs to set the pattern.

First, we want to agree with SSG Gardner that the 1st of the 68th is indeed collocated with the 2d of the 5th at Fort Hood. And, sure enough, the 3d of the 4th is at Fort Bragg. What we don't understand is why he assumed that when we placed the 68th ADA insignia at Bragg we were implying it was the location of the 1st Battalion. Is he going to deny the 3d Battalion, which is located at Bragg with the XVIII Airborne Corps?

Second, we want to insure the Commander, 2d Battalion (Herc), 52d ADA, we are aware that his battalion is "alive and well" and we have informed all airdefensemen of that fact (see p. 61, Jan-Mar 80 issue). But again, there is a battalion of the 52d ADA at Fort Stewart, Georgia, where we placed the 52d ADA insignia.

Third, in designing the Jan-Mar 80 issue cover, we found that to place regimental insignia at the locations of all battalions would badly clutter both the front and back pages. So we decided to place the insignia in the best balanced arrangement we could and draw lines to the locations of their member battalions. If you could have seen the confusion of the many crisscrossing lines you would realize why, for the sake of esthetics, we abandoned that idea. What you see is what we had to settle for as an editorial decision.

Finally, we applaud the pride in unit exemplified by the comments (protests) we have received. And we say, "Viva Lolamy, Semper Paratus, Primus Inter Pares, and all the others." *-Ed.*

Dear Sir:

I was pleased to receive your letter in which you expressed an interest in the airmobile exercise conducted by Charlie Battery, 2d Battalion, 71st ADA, on 19 and 20 November 1979. In preparing for that exercise, and another one for Bravo Battery on 19 and 20 December 1979, extensive use was made of ST 44-169.

The Battalion has found ST 44-169 to be an excellent training document. It provides useful, up-to-date information on how to plan, organize, and conduct a Hawk airmobile exercise. Based on the information in ST 44-169, and the lessons learned from our recent airmobile exercises, the battalion S3 is writing a new Airmobile SOP. Once it is completed, a copy will be forwarded to your office for your review.

I am also inclosing a short article on the exercises and would like to have it published in the AIR DEFENSE Magazine.

DECATUR W. MORSE
LTC, ADA
Cdr, 2d Bn, 71st ADA

The article to which LTC Morse refers is titled "Honing The Edge of Defense" and begins on page 18 of this issue of AD Magazine.

-Ed.

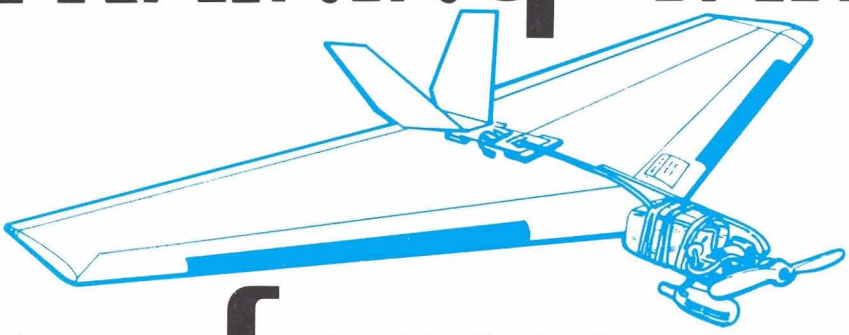
Dear Sir:

Regarding your January-March 1980 issue, the article on Nondivisional C/V mentions two nondivisional C/V battalions when there is actually another: the 4th Battalion (C/V) (SP), 1st ADA, at Fort Bliss. Also, the 1st ADA crest printed in the Lineage and Honors section is the 1st Artillery crest, which came into being in 1959. That "new" 1st Artillery was dissolved in 1971 by order of the Army Chief of Staff. The order directed that artillery regiments revert to their pre-1959 status, thus restoring our old coat of arms, granted to the then 1st Coast Artillery by the Secretary of War on 5 October 1925.

HANS J. SEARLES
CPT, ADA
Adjutant, 4th Bn, 1st ADA

The current 1st ADA Crest.
-Ed.

TRAINING TARGET PERFORMANCE REQUIREMENTS



by Robert L. Chalmers

Crucial to a proper training environment are the elements of building teamwork, developing confidence, and testing stress. In addition, operational readiness evaluations among crews and between fire sections are a must. Unless a realistic visual threat is presented, it may not be possible to provide the kind of training that will produce air defense weapon system operators who can function effectively in the heat of battle.

Pursuing this logic, the US Army TRADOC System Analysis Activity (TRASANA), White Sands Missile Range, New Mexico, in conjunction with the Directorate of Training Developments, Fort Bliss, Texas, recently conducted an Air Defense Training Target Performance Requirements Study. Their objective was to find out what threat capabilities must be provided by aerial targets in each of the AD weapon systems to assure viable training and testing programs. Included in the study were the Redeye, Chaparral, Improved Chaparral, Vulcan, IHawk, Duster, Stinger, Stinger-Post, Roland, DIVAD Gun, and Patriot weapon systems. For ease of study, the weapons were grouped according to the method used to guide the projectile to the target. The categories were as follows:

- Passive Infrared Homing Missile Systems.
- Gun Systems.
- Guided Missile Systems.

Passive infrared homing missile systems include the Redeye, Stinger, Stinger-Post, Chaparral, and IChaparral. Because missiles fired from these weapons use infrared (IR) emissions from the target for guidance, the training target must provide an omnidirectional IR signature. In addition, all three systems use an optical sight or sight reticle to acquire the target visually and track it until missile launch. Therefore, the target must also provide a clear visual signature.

For tracking purposes, the Redeye and Stinger have trainers that are used in conjunction with a moving target simulator (MTS). They provide practice over a wide range of target speeds and maneuvers. It has been recommended, however, that the trainer for Stinger be augmented with IFF to provide even greater realism.

The Chaparral does not have trainers of that type and requires an aerial tracking target. Full-size manned aircraft, full-size drone aircraft, subscale drone aircraft, and the radio-controlled miniature aerial target (RCMAT) are suitable tracking targets for the Chaparral weapon system.

A firing target for these systems must have a valid target hit indicator for evaluating the firing exercise and instilling gunner confidence. A warhead detonation method is preferred because the gunner receives a visual indication of his results. The target must be large enough to insure that the missile has a high probability of

impacting on the target. Further, it must be of sufficient hardness and rigidity to assure detonation.

The ballistic aerial target system (BATS) was judged to be inadequate by the study team. It is too small to insure a high probability of a hit and it provides only one target presentation, which must be the firing one. It also does not have a single omnidirectional IR source near the center.

The study team concluded that one target configuration should be developed for the Redeye, Stinger, and Chaparral firing exercises. It should be a towed target with a cross-sectional area large enough to insure a high-hit probability and a central, omnidirectional IR source. One target configuration that should meet the requirements for a common Redeye, Chaparral, and Stinger target is illustrated in figure 1. It should be towed by a high-performance drone aircraft or by a manned aircraft with appropriate waivers to AR 385-62 and AR 385-63. These ARs prohibit firing missiles at manned aircraft. The target should be towed at speeds that will challenge the crew.

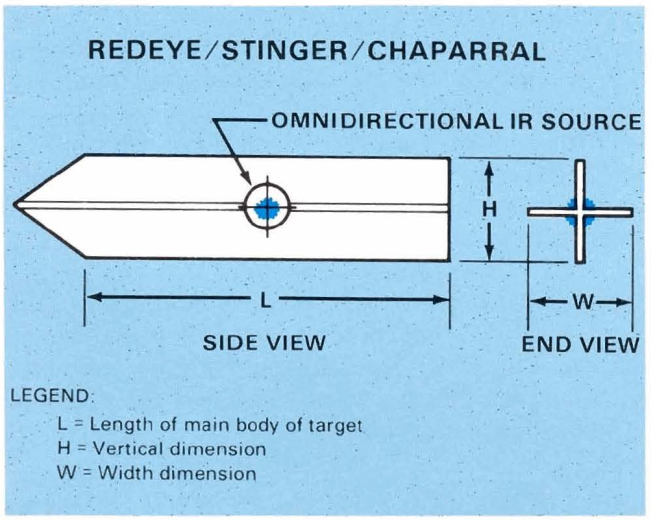


Figure 1.

Duster, Vulcan, and DIVAD--the gun systems--are similar to each other in their requirements for simulation of fixed-wing and helicopter threat aircraft.

All three have optical tracking capabilities either as primary or secondary tracking systems. Therefore, the tracking targets must provide a visual signature. The DIVAD Gun is expected to have simulation equipment to present tracking targets for operator training. These targets should be enhanced with IFF and electronic countermeasure (ECM) capability. Tracking targets suitable for the Duster and Vulcan systems include full-size tactical aircraft and subscale drone aircraft (fixed wing and helicopter). Miniature drones such as the RCMAT are also satisfactory when flown at scaled speeds and ranges.

For firing exercises, towed targets lend themselves well because they provide multiple engagements without damaging the towing vehicle. However, the 2-foot x 12-foot banner currently used for the gun systems was judged to be inadequate. It has poor visibility and is limited to the speeds at which it can be towed.

Ideally, the improved target should be towed by drone or manned aircraft of high performance capability to promote realism in crew training. It should have a visual signature to allow acquisition and visual tracking but must be small enough to be towed at the recommended speed. A small tow body or banner with visual augmentation such as a light source or smoke generator would meet the requirement. In addition, a valid indication of firing results is necessary to evaluate the exercise. A bullet counting device or a miss target indicator could be mounted on the target. The results should be displayed on the ground in near real time to attribute results to the correct gun when more than one gun is firing.

The gun systems also require training targets that simulate the helicopter threat aircraft. A drone helicopter-towed target with popup capability, or a popup silhouette target system should be developed to replicate the jinking tactics expected of threat attack helicopters.

Included in the guided missile system category are the US Roland, IHawk, and Patriot weapon systems. All three systems are expected to have trainers and simulators that will present tracking targets along with IFF and ECM. With these simulators, there may be no need for an aerial tracking target for IHawk and Patriot except to present ECM techniques from a source external to the system. The US Roland, however, does require an aerial target for optical tracking.

The IHawk requires a target for firing exercises because the radar signal reflected from the target is used for guidance by the IHawk missile. The target should be an expendable drone or a towed target. If a towed target is used, it must provide a larger radar cross-section (RCS) to the IHawk than the vehicle towing it or be sufficiently separated from the towing vehicle to avoid any confusion in tracking.

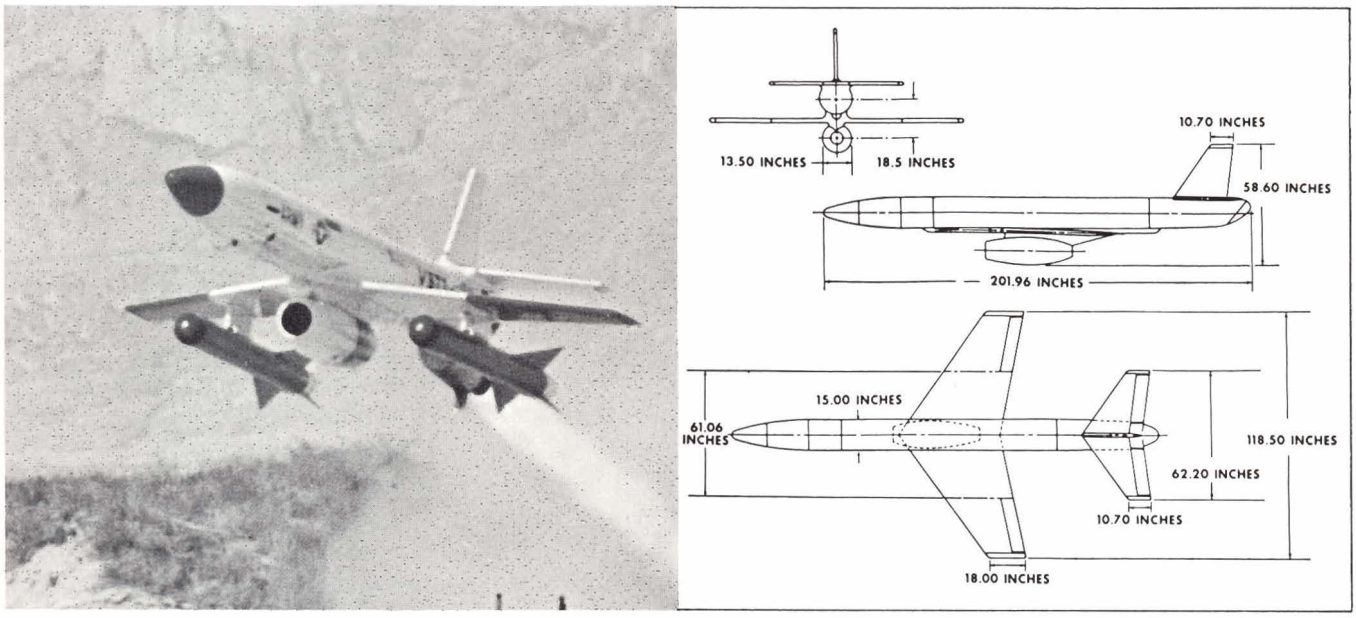


Figure 2.

The existing target for IHawk firing exercises, the MQM-107A with tow (fig. 2), was considered satisfactory by the study group. The group noted that the same target, with proper modification to the tow, could also be used for the US Roland.

A towed target could be used for Patriot; however, it may be difficult to provide enough separation between the tow and the towing vehicle. The study team concluded that a low-cost, expendable miniature drone or glide vehicle should be developed instead. It would be preprogramed and launched by a manned or drone aircraft at an altitude and range that would assure a safe exit for the launch vehicle before the Patriot firing. The target must also contain the necessary flight guidance, termination, and recovery equipment needed to satisfy range safety requirements. This target could be used for IHawk and Roland as well.

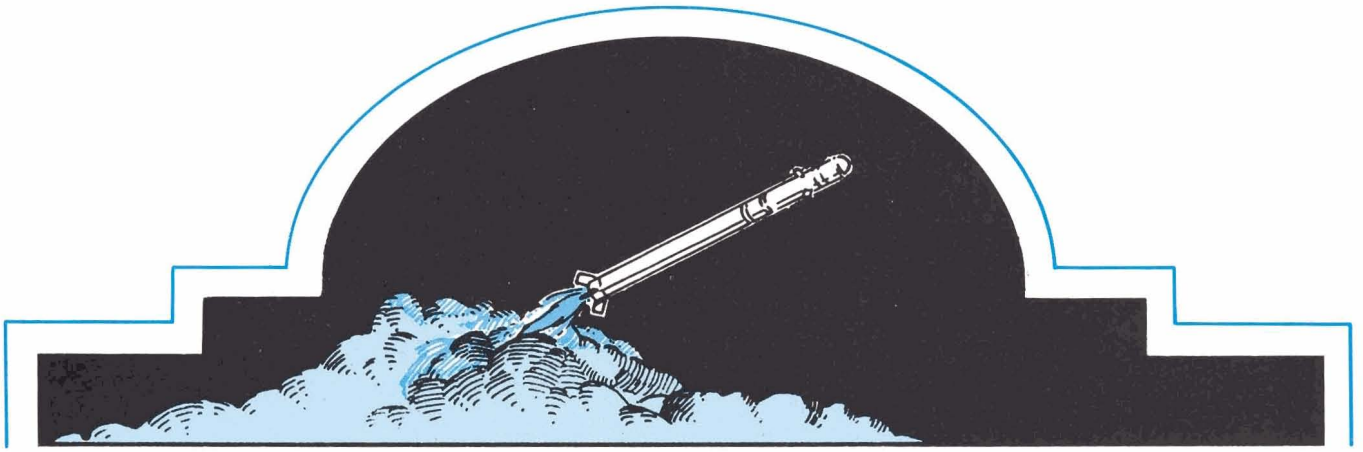
Intercepts for IHawk and Patriot are likely to be beyond visual range. US Roland intercepts will probably be within visual range; however, it will be difficult to evaluate a near miss. Therefore, a miss distance indicator should be used on the firing target for these systems.

The study team stressed that both tracking and training targets for all AD weapon systems should be equipped with ECM and electro-optical countermeasures (EOCM) capabilities. These environments must be provided during training if AD weapon operators are to react effectively against an actual air threat.

Throughout the study, external factors such as environment, gunnery ranges, and electronic warfare restrictions were considered in determining specific performance requirements for each of the AD systems. The training target requirements were placed in categories and compared with characteristics of existing aerial targets. Those requirements that could not be met with current targets were identified for possible target modification or new target development.

For information about the TRASANA report, write to the author at ATSA-DT-RDS, US Army Air Defense School, Fort Bliss, TX 79916, or call AVN 978-5017/5545.

Robert (Bob) Chalmers is Chief of the Targets and Training Devices Section, Directorate of Training Developments, Fort Bliss, Texas. Having served in a wide variety of assignments associated with air defense training, he is currently working with AD targets and training devices for existing and future weapon systems.



REDEYE TRAINING STUDY

There is strong evidence that the era of United States battlefield supremacy may be in jeopardy. One factor is the developing Warsaw Pact air threat to the US field forces. The air threat is highly sophisticated, responsive, and massive. In particular, the Soviet Hind attack helicopter is a formidable threat to our armored and mechanized infantry and frontline forces. The Redeye manportable air defense system (MANPADS) and the follow-on Stinger offer a potential counter to this threat. However, the effectiveness of these weapons will be largely dependent on the quality and quantity of the gunners' training.

The Study.

At the request of the US Army Air Defense School, the TRADOC Systems Analysis Activity (TRASANA) conducted a Redeye Training Study in support of a DA-directed Army Training Study. The Redeye Study assessed the impact of training effectiveness on combat effectiveness and related the number of aircraft destroyed by Redeye to training proficiency.

Because the Army faces constrained resources for individual and unit training, we must make optimum use of the resources available to build and improve combat effectiveness. So the Redeye weapon system was chosen by the Army Training Study Group (ARTSG) to provide a vehicle for examining the relationships among training resources, training programs, individual and unit proficiency, war models, and combat effectiveness.

During the study, five advanced individual training (AIT) classes (a total of 125 students) were tested. Unit training, as it presently exists in 13 tactical units in the continental United States and in 8 tactical units outside the US, was also investigated. This action involved 1,319 Army, 62 Marine, and 137 National Guard test subjects. In addition, the current status of Redeye training to the point of proficiency at the AIT and unit level was monitored through the use of questionnaires and tests developed and administered by the study team. Unit training and institutional refresher training for Reserve units were investigated as well. The analyses applied were geared to provide data associations between various elements of the questionnaires and tests.

The most difficult of all the tasks the gunner has to accomplish is proper use of the range ring profile (RRP) matrix. The 5 x 6 matrix consists of 6 categories of aircraft and 28 numbers arranged in 5 columns. Based on a comparison of the aircraft size with the range ring, the gunner uses the matrix to decide whether to activate, fire, hold-fire, resume fire, or cease fire. Because there is no time to check reference material during battle, successful engagement of enemy aircraft requires that the entire matrix be committed to memory.

AIT Results.

Proficiency in employing the RRP is broken down into three ranging tasks: identify aircraft (IA), determine range ring coverage (DRRC), and action-fire/hold-fire (AFHF). All three must be correct for the gunner to get a "kill." Figure 1 (page 16) shows the RRP proficiency demonstrated by the five AIT classes tested. The last column indicates the percentage of students who were able to get all three correct at any one time.

The requirement for enlistment in the Army is based on the Armed Forces Qualification Test (AFQT) score. The current minimum AFQT score for male enlistees is 10 or above. which is a percentile score. The levels of proficiency in the

RRP and in the moving target simulator (MTS) were determined for each of the AFQT mental categories. The results are shown in figure 2.

In observing the decreasing order of scores for each of the major lower mental categories, note that for all categories performance was unacceptable in all areas of the RRP test. But performance was within an acceptable range of probability of hit (Ph) in the MTS with the exception of category IV B. Determination of range ring coverage was the most difficult for all mental categories. However, it was acutely difficult for category III B and category IV. This was one of the major factors in dropping the all-actions-correct score to less than 25 percent.

RANGE RING PROFILE PROFICIENCY

CLASS	NUMBER STUDENTS(n)	RANGING IA	RANGING DRRC	RANGING AFHF	ALL ACTIONS CORRECT
44	(39)	0.724	0.436	0.707	0.262
45	(27)	0.743	0.414	0.704	0.228
46	(21)	0.690	0.378	0.751	0.204
47	(12)	0.685	0.537	0.764	0.292
48	(23)	0.727	0.505	0.761	0.309
AVERAGE		0.719	0.444	0.730	0.256

Figure 1.

PERFORMANCE VS AFQT CATEGORY

AFQT SCORE	AFQT CATEGORY	(n)	RRP PROFICIENCY IA	RRP PROFICIENCY DRRC	RRP PROFICIENCY AFHF	RRP PROFICIENCY ALL ACTIONS CORRECT	MTS Ph
93-99	I	(1)	0.833	0.611	0.944	0.444	1.00
65-92	II	(8)	0.806	0.694	0.931	0.535	0.81
50-64	III A	(13)	0.761	0.662	0.846	0.427	0.71
31-49	III B	(61)	0.730	0.432	0.731	0.248	0.79
21-30	IV A	(18)	0.642	0.330	0.676	0.133	0.74
16-20	IV B	(16)	0.667	0.281	0.608	0.135	0.66

Figure 2.

Tactical Units.

The results of the RRP for all the tactical units tested during the study revealed much the same information. While the all-actions-correct percentages were slightly higher, no individual unit achieved more than 47 percent. The average score of the Army units tested was 35 percent. The Marine units reached the 37 percent mark and the National Guard units dropped to 31 percent of all actions correct. This test group was also evaluated based on AFQT category (figure 3).

PROFICIENCY VS AFQT CATEGORY

AFQT CATEGORY	(n)	IA	DRRC	AFHF	ALL ACTIONS CORRECT	MTS Ph
I	(28)	0.874	0.726	0.833	0.528	0.87
II	(230)	0.839	0.713	0.793	0.474	0.75
III A	(211)	0.801	0.658	0.757	0.399	0.73
III B	(516)	0.762	0.531	0.685	0.277	0.72
IV A	(111)	0.707	0.409	0.656	0.190	0.73
IV B	(75)	0.674	0.402	0.609	0.165	0.73

Figure 3.

Their performance in weapon operation, shown in figure 3 under MTS, is their ability to progress through the mechanical steps in the actual firing of the weapon. As observed, the measured MTS proficiency in categories II through IV B does not vary significantly while the proficiency in memorizing the range ring matrix (DRRC) does. It is obvious that the problem is in ranging the weapon and not firing it.

WSTEA.

At this point, data from another study came into play. Prior to the Redeye Training Study, TRASANA had conducted a Redeye Weapon System Training Effectiveness Analysis (WSTEA). During the WSTEA, test teams visited every active US division that uses Redeye. Their purpose was to assess the effectiveness of institutional and unit training programs as they relate to gunner proficiency. The results of the testing indicated that numerous problems were common to all Redeye units and sections. In some

locations the problems were so severe that the team judged Redeye to be not combat effective. The major conclusions of the WSTEA were that Redeye firing doctrine should be simplified, and that for units to maintain Redeye proficiency at an acceptable level, training must be standardized, increased, and scheduled at regular intervals.

As a consequence of the Redeye WSTEA, the RRP matrix of 28 numbers has been reduced to 2 numbers. The gunners are now able to range the weapon with no loss in weapon effectiveness.

Proficiency vs Combat Effectiveness.

The Redeye study team further evaluated the level of training and gunner proficiency in the unit by compiling data obtained from the questionnaires and tests given to unit Redeye gunners. From the responses to the questionnaires, the study team was able to relate gunner proficiency to training time. While training cannot be directly translated into combat effectiveness, there is a relationship between proficiency and combat effectiveness. This relationship can be tested through computer simulations.

One series of computer simulations used only the Redeye system for BLUE air defense against the RED air raid. The purpose of these simulations was to evaluate the effect of Redeye proficiency in terms of RED kills as a function of proficiency. In these simulations the proficiency was varied from 0.1 to 1.0 probability of success in increments of 0.1. The size of the air raid was 86 enemy aircraft. The results of these simulations are presented in figure 4.

RED AIRCRAFT KILLED VS REDEYE GUNNNER PROFICIENCY

GUNNER PROFICIENCY (Ph)	RED AIRCRAFT KILLED*
0.1	5.4
0.2	11.1
0.3	14.9
0.4	18.1
0.5	23.5
0.7	24.3
0.8	33.9
0.9	34.2
1.0	40.2

*AVERAGE OF 10 RUNS.

Figure 4.

Recommendations.

Redeye gunner proficiency must be kept at a level sufficient to assure survival of Army assets during an actual conflict. Only when Redeye gunners are properly trained can an acceptable level of proficiency be maintained. After compiling information gathered during various phases of the study, the Redeye training study group made the following recommendations:

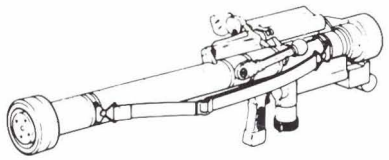
- The feasibility of forming a Redeye battery should be investigated for each Reserve region to provide access to available MTS facilities.
- AFQT Mental Category IV gunners should be ineligible for Stinger training programs.
- Current war models that are considered for analysis of training versus Redeye gunner proficiency should be modified to reflect the gunner's proficiency with each step of the Redeye engagement sequence.

In connection with these recommendations, it was further proposed that the Stinger RRP matrix be simplified. A more realistic activation criterion, such as activate after identification, might also be warranted. Tests should be established to measure components of gunner proficiency such as reaction time and the ability to estimate target range, activation range, and launcher boundaries.

Additional recommendations included suggestions concerning the availability, use, and maintenance of training devices and equipment.

Copies of the report filed by the Redeye training study team can be obtained by writing to USA TRASANA, ATTN: ATAA-THC, White Sands Missile Range, New Mexico 88002.

The Redeye Training Study, coupled with the Redeye WSTEA, provided a data base from which many decisions can be made regarding future Army training resources and programs. The resulting improvements will be the key to optimizing the capabilities of major new weapon systems programed for fielding in the 1980s.



This article is the result of a team effort by Dale Tubbs (Team Chief), Alan Hansen, James Everett, Jim Bryant, Jim Zarret and Joyce Henry.

honing the edge of the defense

by Major Gary L. LeFort

It was a cold, windy day on 19 November 1979 when Charlie Battery, 2d Battalion (Hawk), 71st Air Defense Artillery, moved its equipment and personnel into the two pickup zones (PZs). The first US Army Hawk Airmobile Exercise in the Republic of Korea since 1974 was under way. There was a sense of excitement as battery personnel hustled around the tactical site getting equipment ready for the first CH-47 Chinook helicopter. The purpose of the exercise was twofold. First, the battery's ability to deploy a Hawk assault fire unit (AFU) to a field location by air under tactical conditions would be tested. Second, when deployed, the AFU must become operational and continue its mission in the shortest possible time. Being the closest US Army Hawk battery to the demilitarized zone (DMZ) separating North and South Korea, rapid deployment in the event of open hostilities with North Korea is essential. Contingency plans, like this airmobile exercise, must be rehearsed to maintain the proficiency required for rapid deployment.

Charlie Express was a joint exercise requiring the participation of two additional units. The 4th Quartermaster Company from the 19th Support Command provided equipment rigging support, and the 213th Aviation Company from the 19th Aviation Battalion provided aviation support. Coordination began in early November 1979 because many things had to be done. The landing zone (LZ) had to be reconnoitered, the PZs identified and prepared, loads or "chalks" (as the aviation people would say) had to be determined and checked, a personnel manifest prepared and verified, rigging equipment checked and certified, and an airlift schedule coordinated with all participants. It was a period of extensive planning where attention to detail was critical. Throughout this phase of the exercise, the training document ST 44-169, Hawk Tactical Air Movement, proved to be an invaluable planning tool.

The exercise started at approximately 1000, 19 November 1979, when two Chinook helicopters appeared to the north of the battery. Initial contact was made and the first helicopter swooped into the first PZ, picking up a chalk of personnel and equipment. The second helicopter followed closely behind, maneuvering to the second PZ. It picked up another chalk. Back and forth, the Chinook helicopters shuttled one chalk after another to the LZ where battery personnel were waiting to receive and emplace the equipment. One hour and 39 minutes later, 17 major pieces of equipment were being made ready to continue the mission at the new location.

After becoming operational and assuming its mission, the AFU settled in for the night, ready to redeploy at a minute's notice. Early the next

morning the warning order came, followed by the movement order. Battery personnel, with the assistance of the 4th Quartermaster Company, hurriedly rigged the equipment for redeployment to the tactical site. The first Chinook helicopter arrived at approximately 1000, followed closely by the second one. Time after time they came, picking up equipment and personnel. In just 1 hour and 35 minutes, the AFU was at the tactical site, being integrated back into the battery system.

The exercise was completely successful. Hawk training for the battery had taken on a new dimension. It was realistic training. Battery personnel were proud of their accomplishment and, more importantly, they were confident that should the situation develop where the battery must deploy by air, it would be ready to do so.

Bravo Battery, another of the batteries close to the DMZ, conducted a similar exercise called "Bravo Express" during December 1979. Again, it was a superb exercise providing the battery with realistic training. Battery personnel thoroughly enjoyed it and, as Charlie Battery, looked forward to the time they would go "airmobile" again.

In the above photograph, battery personnel are boarding a CH-47 Chinook helicopter. Involved in the exercise were 42 personnel, including 2 MP dog handlers.

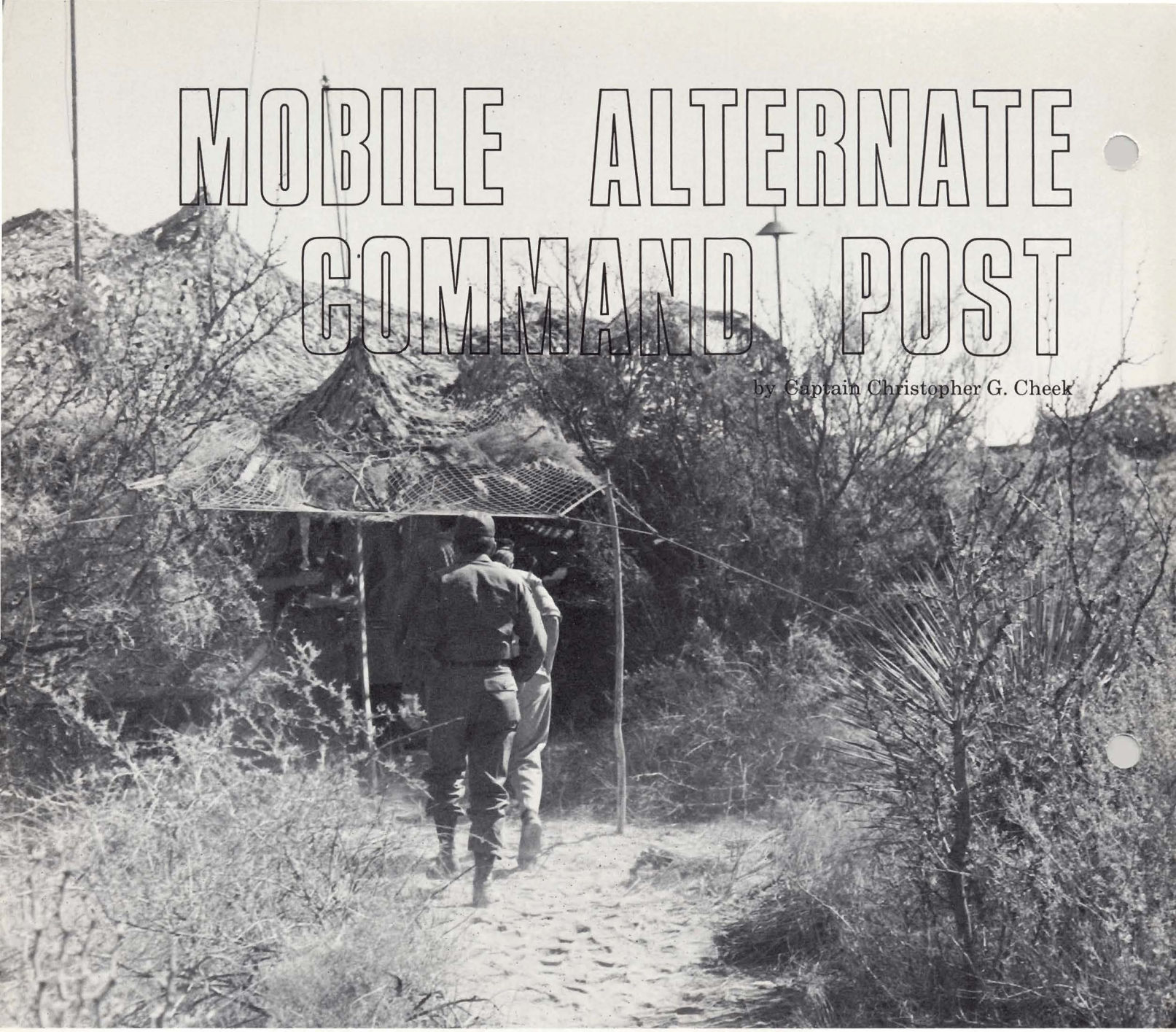
Hawk launcher being hooked to a Chinook helicopter.

Editor's note: Charlie Battery, commanded by Captain Ray C. Gertman, is located approximately 15 km from the demilitarized zone (DMZ). Bravo Battery, commanded at the time of the exercise by Captain Donald C. Baker, is located approximately 17 km from the DMZ. Both batteries are assigned to the 2d Battalion (Hawk), 71st Air Defense Artillery, headquartered at Camp Red Cloud, Korea, and commanded by Lieutenant Colonel Decatur W. Morse. The battalion is one of three Hawk battalions assigned to the 38th Air Defense Artillery Brigade, headquartered at Osan Air Force Base, Korea, and commanded by Brigadier General Victor J. Hugo, Jr.

Major LeFort is assigned to the 2d Bn, 71st ADA, as the S3. He holds a Bachelor's Degree in Business Administration from the University of Massachusetts and a Master's Degree in Business Management from Boston University. Prior air defense experience includes command and staff assignments with Nike Hercules and Hawk.

MOBILE ALTERNATE COMMAND POST

by Captain Christopher G. Cheek



"How am I or my staff going to control this command if the headquarters element receives a direct hit?" That is a question every commander should ask himself if his unit plans to survive and effectively engage the enemy after the first hours of the battle. Currently, it appears that too little emphasis has been placed on the command and control of smaller tactical units and particularly in manual backup systems or alternate command posts. This is apparent from the heavy reliance of commanders on electronic command and control centers, such as the AN/TSQ-73, and from the lack of allocating resources and training time to the manual backup systems. I hope that after you have read this article you will look twice at survivability of the command and control element and the possibility of deploying your own mobile alternate command post.

In the following pages I will discuss why you would want to deploy a mobile alternate command post (MALCP), an example of missions that can be accomplished by the MALCP, considerations for its deployment, personnel and equipment requirements, and general recommendations.

In discussing the reasons why you would want to deploy a mobile alternate command post, let us look briefly at the threat. The threat, as I see it, is a force, vastly superior in size, whose primary

targets in the initial phases of the battle will be command and control centers and the air defense sites. It stands to reason that the group or battalion Army air defense command post (AADCP) will be a high-priority target of the threat. Therefore, your attention should be focused on survivability and reconstitution of the AADCP so that effective firepower is continually brought to bear against the threat. If the MALCP is established and operational prior to the AADCP being knocked out of action, there will be minimum confusion and loss of time. Thus, the command will be more likely to continue tactical operations effectively. Additional key personnel could move to the MALCP while the AADCP undergoes a complete program of reconstitution. The advantages of mobility and simplicity allow the MALCP to be highly flexible to the changes in battle. It can be moved and set up in a relatively short time, and it enhances the survivability of the command and control element.

The first time I encountered the idea of deployment of an MALCP was shortly after I had assumed command of Headquarters Battery, 3d Battalion (Nike Hercules), 71st ADA, in Kornwestheim, West Germany. During the preparation phase of my battalion's 1978 Allied Air Force Central Europe (AAFCE) Tactical Evaluation, I was briefed by my first sergeant (now Sergeant Major Norman B. Nagle) on his idea that called for the development and deployment of an MALCP. His idea called primarily for the deployment of two 2½-ton truck vans M109A1 in the configuration illustrated in figure 1.

After I saw the MALCP vans that had been constructed the year before, we began developing plans for the deployment of the MALCP and for acquiring the men and material required to support the plans. Several plans were developed and tested; however, all the plans were dependent upon the mission(s) that the battalion commander wanted the MALCP to perform. These plans varied from the simple to the complex. The first plan simply called for five men and the two vans to have the mission of setting up an alternate communications center. Later developments of the plan contained the complex missions of setting up a self-contained MALCP, providing a mobile decontamination team, and providing a quick-reaction force.

In the first and most important mission of being a self-contained MALCP, the element was to deploy to a predetermined site upon the outbreak of hostilities. Required tasks were to set up for operations, establish communications with the batteries (and, if possible, with higher headquarters), and monitor and record the messages to and from the BOC. When the MALCP detected a loss of communications at the AADCP, it was to assume control of the battalion and perform all staff functions until redirected by the battalion commander. These functions included control of air defense status, personnel loss reporting, logistics support, and NBC and intelligence reporting.

In the second mission of maintaining a mobile decontamination team, the MALCP was (upon order) to deploy its pretrained decontamination team. This decontamination team was to have the following functions: help any battery or the AADCP when it received effects of an NBC attack, help any battery during periods of reconstitution, and perform the surveying and monitoring of NBC agents when the MALCP prepared to move to a new location.

In the third mission of providing a quick reaction force, the MALCP (on order) was to deploy a force of 6 to 16 men armed with automatic and semiautomatic weapons for the purpose of reinforcing one of the batteries in suppressing an aggressor attack. When not deployed, this force would act as additional security force personnel at the MALCP, as messengers for the battalion commander (if needed), and to reconnoiter alternate sites for the MALCP or for the batteries.

In discussing deployment of the MALCP, three important considerations either have to be planned for or exercised before deployment. The first consideration is predetermined site locations. These sites are selected because of the high-priority target which the MALCP represents and to insure minimum confusion and loss of time. In selecting the sites, first conduct a map RSOP to see what place is near the center of the battalion or located on terrain offering good line of sight for the communications. Then conduct a ground RSOP of the sites selected on the map to insure the sites are accessible, concealable, defensible, and conducive to good communications. To secure communications, consider conducting an RSOP with your FM radio van to make certain that the area does afford good communications and accessibility. When feasible, the communicational terminal should be remoted from the remainder of the CP.

The second consideration for the deployment of the MALCP is the planned use of radios. This insures that all the batteries know the primary and

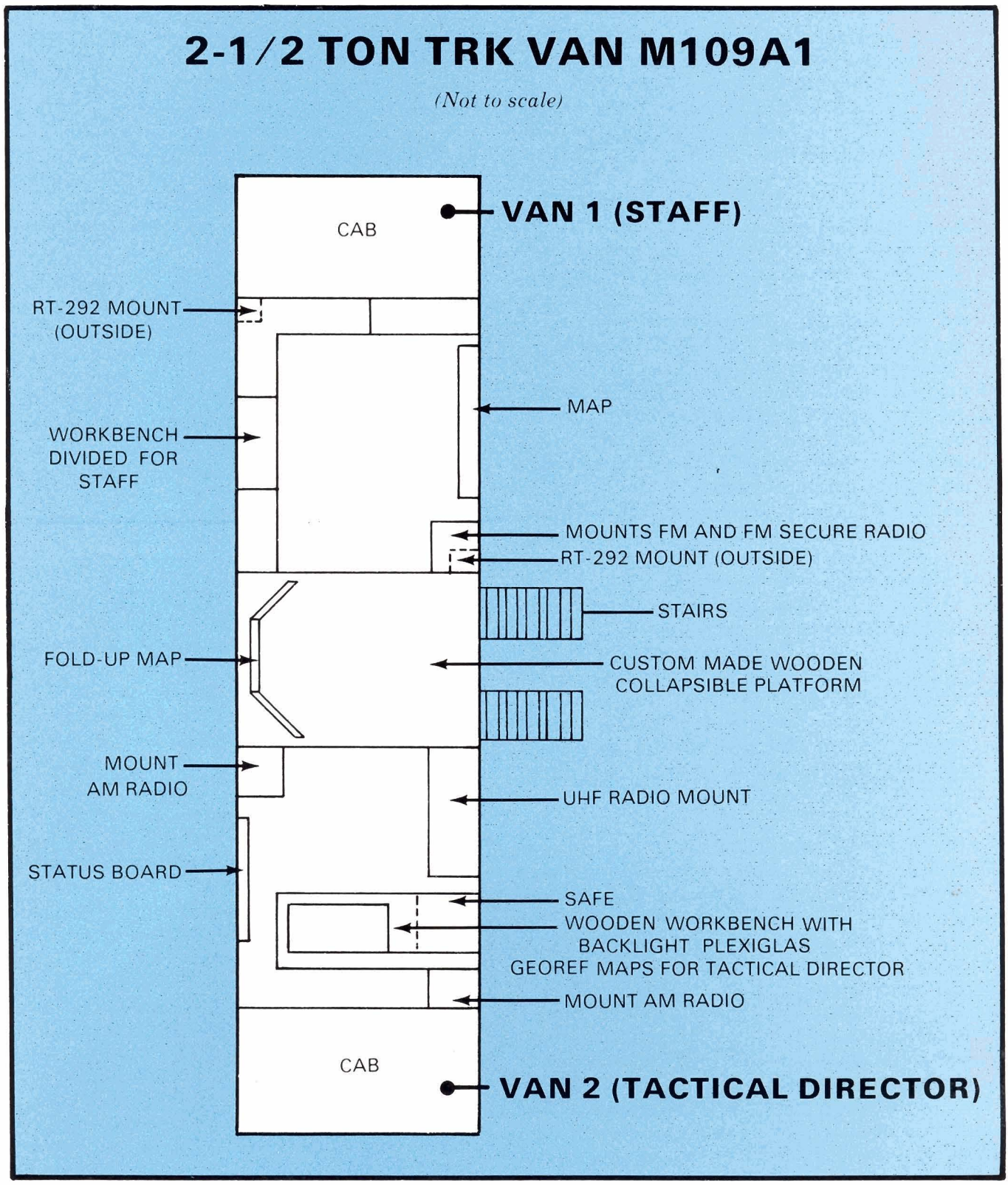


Figure 1.

secondary means of communications. In the case of the MALCP that I deployed, the primary means of communications for the staff and the tactical director was UHF multichannel communications.

The secondary means of communications for the staff was FM and FM-secure radio, while the tactical director used one AM radio for tactical operations and the other AM radio for early warning.

The third consideration for the deployment of the MALCP is to exercise the use of the MALCP to get the batteries accustomed to operating with the MALCP using UHF, AM, and FM radios. This can be accomplished by practice exercises in which the MALCP will deploy while the AADCP is in control of the battalion. A communications loss is then simulated in which the MALCP recognizes the loss of communications and assumes control, eventually returning control back to the AADCP.

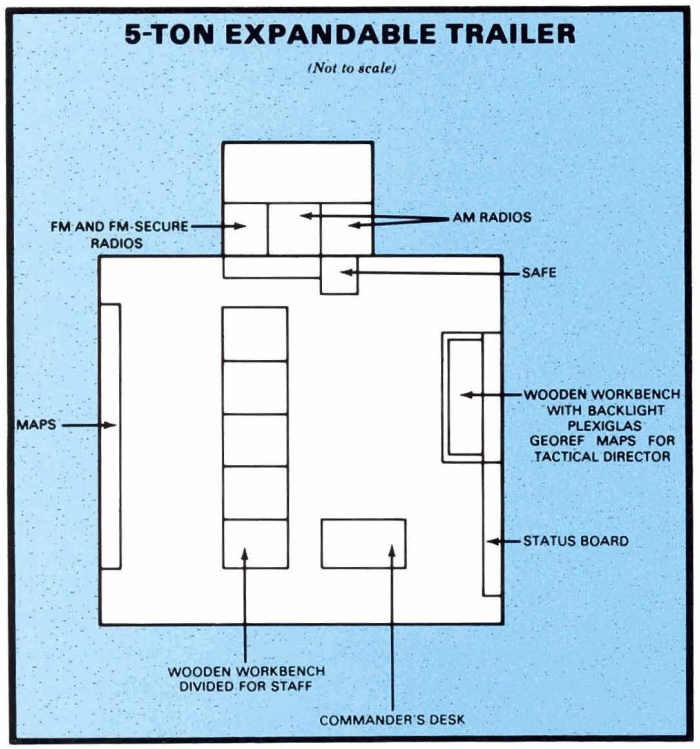


Figure 2.

This exercise can be repeated over and over, simulating loss of communications and using UHF, AM, and FM radios to control the battalion.

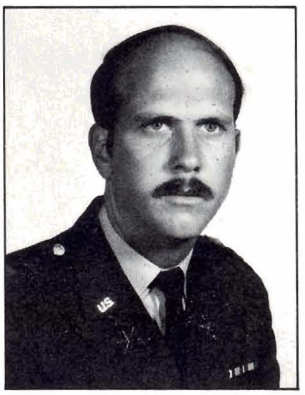
To accomplish the missions assigned to MALCP, it was necessary to acquire the following personnel: tactical director/OIC, operations sergeant, tactical director's assistant, UHF radio operator, AM radio operator, FM radio operator, generator operator, cook, one person from each staff section (S1, S2, S3, and S4), 10 personnel for the decontamination team/quick reaction force, 10 personnel for the security force, and 6 personnel for the quick reaction force.

In addition to the personnel requirements, the MALCP had the following equipment requirements: two 2½-ton truck vans M109A1 with the equipment shown in figure 1, two 2½-ton cargo trucks, two 1½-ton cargo trailers, a 1¼-ton cargo truck, a 1¼-ton ambulance, two ¼-ton utility trucks with FM radios, 30-kw generator, GP small tent used as a cook tent, GP medium tent for sleeping, and supporting equipment such as concertina wire and camouflage nets.

In considering the way the MALCP was deployed in my battalion's 1978 AAFCE Tactical Evaluation, I would recommend the following: first, that the equipment and functions of the vans be consolidated into a 5-ton expandable van M292 as shown in figure 2, to centralize control of operations. Second, I would emphasize use of the AM radio for the tactical director and FM and FM-secure radios for the staff functions. Third, I would make training situations as realistic as possible, because through realistic training your personnel will be able to perform their mission.

Although I have not described every task that must be accomplished by the MALCP, by using our exercise as an example you should be able to deploy a highly effective MALCP and improve the continuity of operations of your own command.

Captain Cheek graduated from North Georgia College. He was commissioned in Armor but later transferred to Air Defense Artillery. He has served in Germany with the 3d Bn, 71st Air Defense Artillery (Hercules), as a battery executive officer, assistant operations officer, and battery commander. He served previously at Fort Lewis, Washington, with the 1st Bn, 67th ADA (C/V) (SP), in Chaparral and Redeye assignments. He is presently assigned to the 5th Bn, 52d Air Defense Artillery, Fort Stewart, Georgia.



AMERICA'S COMMITMENT TO FREEDOM

Major David M. Bobbey, Chaplain for the 2d Squadron, 3d Armored Cavalry Regiment, won the George Washington Honor Medal from the Freedom's Foundation for the following essay on the subject, "America's Commitment to Freedom." This is the second time he has been honored with the George Washington Honor Medal.

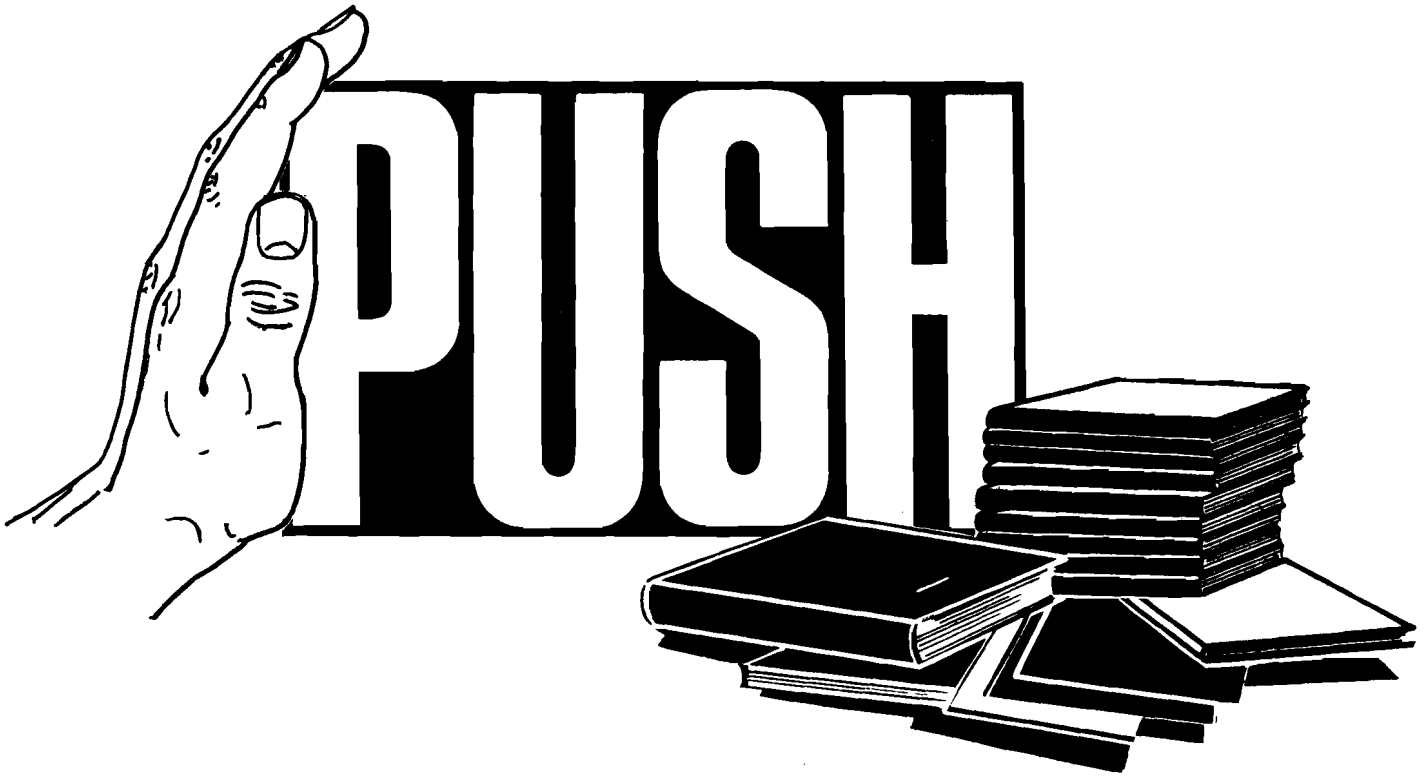
At the turn of the century, my father emigrated from Eastern Europe to this country because he believed that America was committed to freedom. My oldest brother, and thousands like him, enlisted and fought in the Pacific during World War II because he believed in America's commitment to freedom.

Today, an ominous cloud is hanging over the United States. It's a cloud of doubt and pessimism that seriously threatens to undermine the basic foundation of our nation; that of justice, liberty, and freedom for all. The "Look Out For Number One" philosophy has pervaded the thinking of many and tests our wholehearted commitment to freedom. Voices are heard from many quarters of the USA saying that we have no right to be involved in the affairs of other countries and peoples, while the tentacles of Communism are slowly strangling the freedom of many other countries. The philosophy of "Number One" was espoused thousands of years ago when Cain said with disdain to God, "Am I my brother's keeper?" Of course, the real answer was yes. Someone has said, "The only thing necessary for evil to triumph is for good men to do nothing." That is why I believe America must be committed to freedom.

America has been singularly blessed as no other nation in history. There are opportunities in the United States for all men, regardless of their race, creed, or religion. They are not found to such an extent in any other country as they are in the United States of America. America is not perfect, but we're the best of the rest. Because of this it is our destiny to be committed to freedom, for as the United States goes, so goes the world.

If we are not committed to freedom, thousands of our honored dead, buried in foreign and domestic graves, will rise up in accusation against our nation that they have given their lives in vain. We cannot and must not let their memory be forgotten or the torch of freedom-for-all be extinguished.

As long as there is a United States of America, may it always be said the one virtue that shines brightly above all others is her commitment to freedom both at home and abroad. Then, and only then, will she be in deed as she is in word: "One nation, under God, with liberty and justice for all."



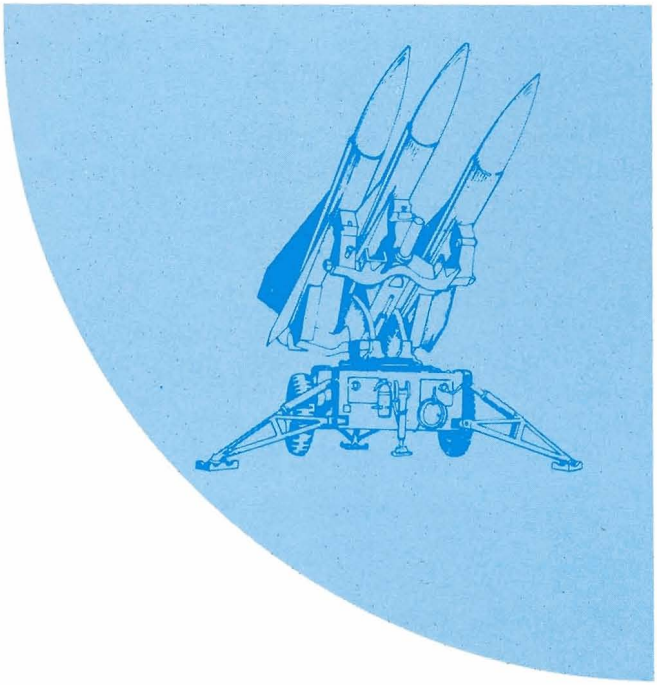
Until now, each Army unit has had to manage its own program of publication distribution by maintaining complex DA 12-series forms. The current DA 12-series forms (40 in all), when laid end-to-end, extend more than 110 feet and contain more than 10,000 possible entries and combinations of entries. Under this system, the burden of publications distribution lies with the unit, often with young, inexperienced soldiers. Because of inexperienced personnel and the complexity of the DA 12-series forms, units do not always request the necessary publications, sometimes request the wrong publications, and often request incorrect quantities. The results are waste, high cost, and adverse impact upon unit maintenance and readiness. In the fall of 1977 the Army Vice Chief of Staff approved a new concept of publications distribution. By this concept, *initial* distribution will be sent to each unit based on functional need; quantities sent will depend on unit size and other factors. The key point is that units will no longer have to request Army publications for *initial* distribution, they will receive what they need automatically. DA will PUSH publications to each using unit--the units will not have to PULL them by maintaining the DA 12-series forms. An essential element in the PUSH concept is that writers of Army publications know best who needs their publications; therefore, they can best direct them to users. Effective 1 April 1980, all DA Forms 260 (Request for Publications) submitted by proponents of HQDA publications must be accompanied by a DA Form 260-1-R (Test) or 260-2-R (Test) (Publications Profile--PUSH Distribution). These forms will permit the proponent, in coordination with TAGO, to determine the initial distribution of Army publications.

The PUSH distribution system is currently under test in the 2d Armored Division, and a fully automated test with over 200 units participating will begin on 1 June 1980. Hang on, units--help is on the way!

Being the first air defense officer ever assigned to the Landing Force Training Command, Pacific (LFTCPac), at the Naval Amphibious Base in San Diego, California, is proving to be a unique tour of duty. I am detailed to the Staff Planning School in the Supporting Arms Branch, along with one Naval and seven Marine officers, which is commanded by a Marine lieutenant colonel. My primary duty is serving as the instructor in air defense planning, equipment, personnel, and tactics. The instruction is presented to Marine, Army, and Navy personnel as well as Allied officers. The courses involved are presented as resident courses in San Diego and nonresident courses in the western Pacific by Mobile Training Teams (MTTs). The MTT program has given me the opportunity to instruct in such places as Okinawa, Japan, and Hawaii.

A TOUR WITH THE MARINES

by Captain James W. Green



Because the majority of the students are US Marines, I was initially tasked with learning the Marine usage of their air defense assets (Hawk and Redeye) in amphibious operations, and then with developing a program of air defense instruction. The courses developed for presentation included:

- An Overview of Air Defense Systems.
- Hawk Missile System and Operation.
- Redeye Missile System.
- Small Arms Fires Against the Enemy Air Threat.

Following is some insight into the USMC air defense organization and concept.

The Marines have the Improved Hawk in their light antiair missile (LAAM) battalions and the Redeye missile system in their forward area air defense (FAAD) batteries. One FAAD battery is authorized for each of the three Marine air wings (MAW) in the USMC. The FAAD battery consists of five platoons (fig 1), three sections per platoon (fig 2), and five two-man teams per section (fig 3). One battalion is authorized for each MAW (Hawk battalion configuration similar to US Army).

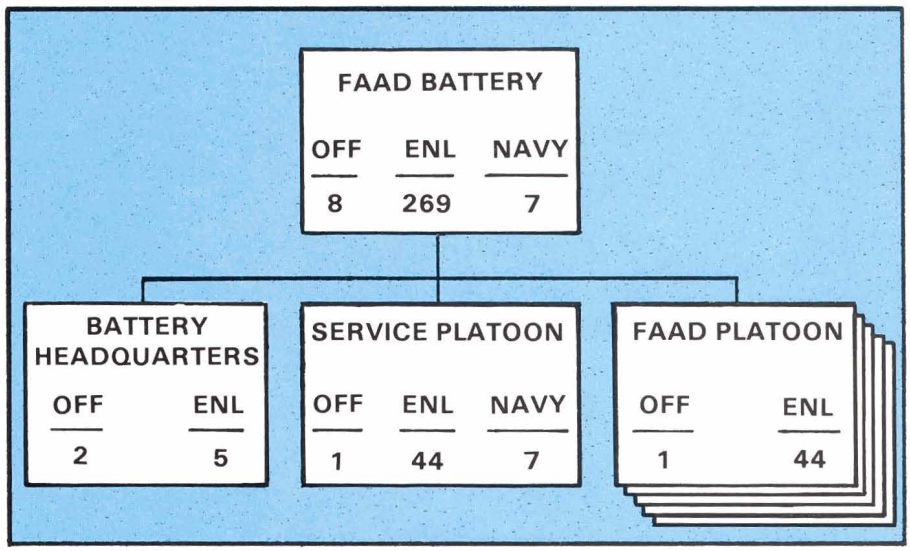


Figure 1. FAAD Battery Organization.

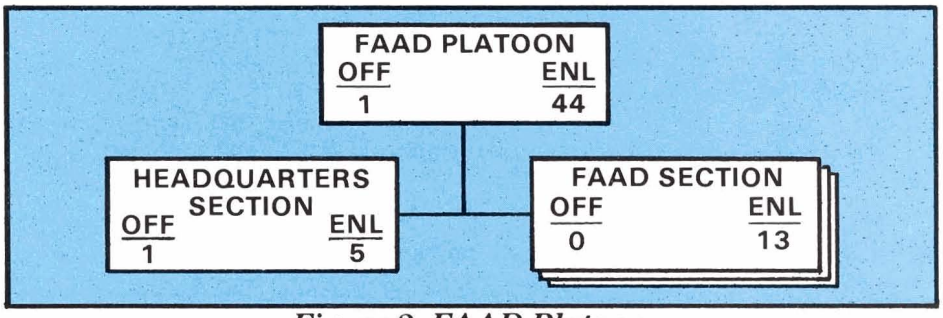


Figure 2. FAAD Platoon.

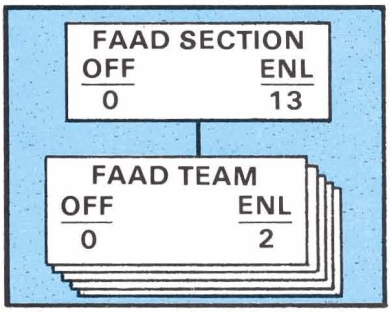
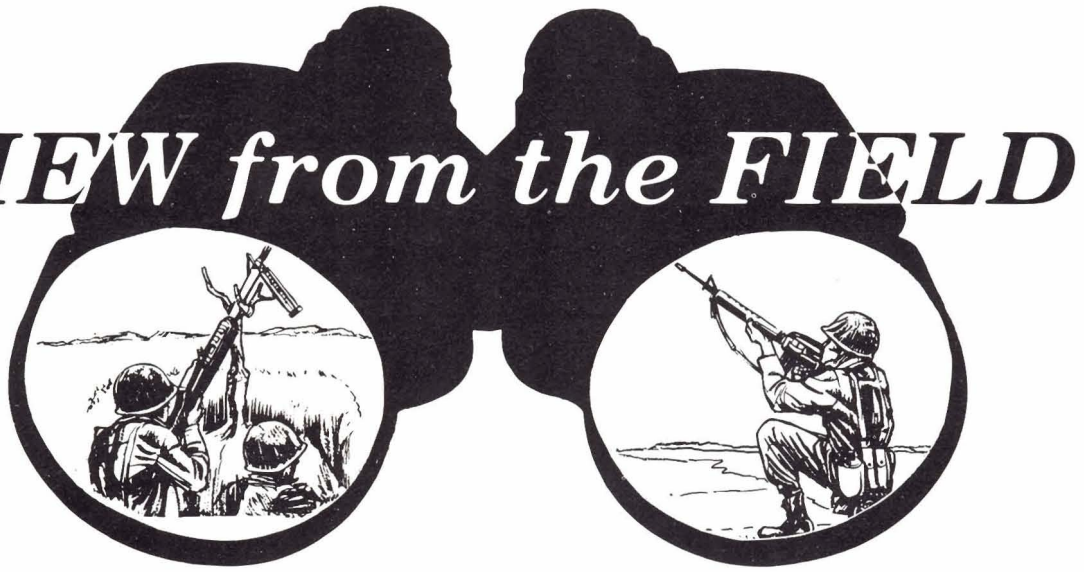


Figure 3. FAAD Section.

In amphibious operations the FAAD battery elements would be deployed ashore early, supplementing small arms air defense fires. The LAAM battalion assets would be placed ashore as soon as areas become available. The LAAM and FAAD assets are only part of the Marine Corps antiair warfare (AAW) concept. The AAW plan relies not only on Hawk and Redeye, but heavily on air-to-air combat (USMC F-4 (Phantom) interceptors). In AAW planning the Marine interceptors would provide long-range air defense with the LAAM and FAAD elements supplementing that coverage. The USMC organization and use of their air defense assets constitute the fundamental differences from the standard US Army format, primarily due to the USMC organic aircraft and the amphibious nature of their operations.

So there you have it. The USMC AAW concept is being taught at a naval amphibious base by an ADA Army officer. This assignment has broadened my knowledge of the organization and use of air defense assets, while permitting me to serve with some fine officers in both the US Marine Corps and Navy. It is truly a pleasant and profitable experience.

Captain Green graduated from Saint Johns University in 1973 and subsequently served as a Redeye, Chaparral/Vulcan, and tank platoon leader in Europe. He also commanded a Hawk battery in Korea. He is a graduate of the Air Defense Artillery Officer Advanced Course and is currently assigned to the Landing Force Training Command, Pacific, San Diego, California.



HIP POCKET TRAINING

by Second Lieutenant Dale E. Brown
Battery A, 1st Battalion (Hawk), 65th ADA

General John J. Pershing was once quoted as saying, "All a soldier needs to know is how to shoot and salute." Even in those relatively simple times of soldiering, I'm sure that General Pershing would agree that he understated the need for good, comprehensive training. While the ability to shoot and salute is still important, today's soldier is required to be proficient in a great number of skills.

A commander has a number of means at his disposal to evaluate training within his command. The quality of individual training is shown by the results of the skill qualification tests (SQTs). Collective training also may illuminate individual training weaknesses. There is, however, a large void between the occurrences of these evaluation processes. Skill qualification testing, for example, takes place every other year for each soldier. To fill this evaluation gap, a commander needs a means of evaluating the quality of individual training on a more frequent basis. The 1st Battalion (Hawk), 65th ADA, has developed a method of evaluating individual training, known as "Hip Pocket Training."

Hip Pocket Training consists of several common soldier's tasks evaluated by the battalion S3 section on a weekly basis. The number of tasks depends upon their complexity. The program has a threefold purpose. In addition to being the evaluation tool already discussed, the program constitutes training in itself and gives subordinate leaders an opportunity to perfect their trainer skills.

Task sheets listing the skills to be tested are distributed prior to the beginning of the week. Common soldier skills from FM 21-2 (Test) are used. The task sheets list the task, condition, standard, and references for each skill in accordance with FM 21-6, How to Prepare and Conduct Military Training.

The section chief is the primary trainer in the Hip Pocket System. The term "hip pocket" refers to the type of knowledge a section chief can carry with him to conduct spontaneous training when an opportunity arises. Hip Pocket Training is an appropriate filler for the unforeseen dead spots that surface throughout the duty day. The section chief has a variety of methods available to convey his instruction. The most successful and preferred method is performance-oriented, hands-on training. Another highly successful method is to use the Training Extension Courses (TEC) Program. This method is especially valuable when the section chief is involved with other duties and one or two members require training.

Evaluation is conducted at the end of the week by the battalion S3 section. It consists of the soldier performing under the conditions of the standard listed on the task sheet. Each skill is broken down into a series of critical steps according to those listed in the soldier's manual. All steps must be successfully completed for the soldier to receive a "GO." Evaluation is conducted where the soldier normally performs his duties. An equal number of soldiers from each battery is evaluated for statistical purposes. Results, compiled by the S3 section, are broken down, identifying battery, platoon, and section chiefs (fig. 1). The information is then presented at commander's and staff call. This allows battery commanders to see how their training stands within the battalion and to identify outstanding trainers. It also identifies those who require assistance in perfecting their trainer skills.

HIP POCKET TRAINING EVALUATION SHEET

NAME PFC LUKENS BATTERY A

PLT LDR 2LT HENSON

PSG ELLIS

SEC LDR SGT APPLEBY

TASK # 441-16D-1010 RECOGNIZE CONTAMINATED AREA SIGNS

STEP		GO	NO GO
1	CHEMICAL	✓	
2	BIOLOGICAL	✓	
3	RADIOLOGICAL	✓	
4	CHEM. MINEFIELD	✓	
5	BOOBYTRAP	✓	
6	UNEXPLODED MUNITIONS	✓	
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

TASK CONTAMINATION SIGNS (GO) NO GO

SIGN SSG Langly

DATE 22 FEB. 80

Figure 1.

Initial results were generally low, as with any new program. But the passage of time has shown a definite upward trend in the results. The Hip Pocket Training Program allows the commander to sample his unit's training on a frequent basis--something that couldn't be achieved by the standard testing tools.

The Hip Pocket Program has its negative aspects. Section chiefs have a tendency to place Hip Pocket Training above any other training within their section. Commanders must insure that other training is not sacrificed. Care must also be taken to see that adequate facilities and training materials are present for the section chief's use.

The importance of a sound training program cannot be overstated. Perhaps Douglas McArthur, in the position of Chief of Staff of the Army, said it best in his annual report of 1933 when he wrote, "In no other profession are the penalties for employing untrained personnel so appalling or so irrevocable as in the military."

RELIABLE SHIELD

9th INFANTRY DIVISION AIRSPACE MANAGEMENT

by Major Herbert B. Long

"Reliable Shield" and "ADA in the Heavy Division" are published as complementing articles in this issue of AIR DEFENSE Magazine. Both are examples of a long and continuing series of individual initiatives in airspace management. Many aspects of the initiatives described in these articles have merit. However, due to existing equipment limitations and the personnel requirements to man these systems, plus insufficient data to know whether these concepts work in other than limited scenarios and in the European environment, the total concepts or implementation cannot be indorsed for worldwide adoption by the US Army Air Defense School or the Department of the Army at this time. Additional analysis and refinement are ongoing to approve concepts and equipments for use by ADA units now that will transition to improved systems when modern equipment becomes available.

Army airspace management for the tactical operations area (division rear boundary forward to the covering or screening force area) has been the topic of many discussions, studies, and manuals during the past 20 years. It has received increased interest and emphasis recently in joint readiness exercises Reforger, Jack Frost, Gallant Eagle 80, and Brave Shield. The need for an Army airspace management system forward of the division rear boundary is apparent; however, there is no common system in the Army today to manage that airspace.

In 1977 the Commanding General of the 9th Infantry Division and Fort Lewis, Washington, decided upon action to improve the division's air defense posture and issued the following instructions to the Commander, 1st Battalion (C/V) (SP), 67th Air Defense Artillery:

"Using existing resources, determine realistic ways to qualitatively and quantitatively upgrade the 9th Infantry Division's air defense combat capability by reducing or resolving the following deficiencies:

- Insufficient ADA firepower for adequate coverage.
- No early warning systems.
- No systems for managing divisional (Army) airspace.
- Unrealistic ADA training scenarios."

This article will focus on the third area of concern: "No systems for managing divisional (Army) airspace."

To develop, test, and implement an airspace management system for the Division, a review of existing doctrine and SOPs was fundamental. A feasibility analysis of FM 100-42, US Army/US Airspace Management in an Area of Operations, was conducted. The analysis focused on jointly agreed upon procedures and guidance for airspace control and management functions in an area of operations. FM 1-60, Airspace Management and Army Air Traffic in a Combat Zone, provides the Army doctrine for airspace control and airspace management. A detailed analysis of FM 1-60 disclosed four major problem areas:

- Doctrinal requirements (FM 1-60) are vague and unrealistic.
- Division has no adequate structure to accomplish the airspace management mission.
- Forward area airspace management responsibilities not emphasized.
- No common methodology for division implementation.

A brief insight into the scope of these problems follows.

FM 1-60 states that the maneuver unit commander (normally division, brigade, or battalion) is responsible for coordinating airspace activities when those activities may impact upon other airspace users. However, duties and

responsibilities of the airspace manager are not defined. The division commander has the airspace management element (AME) within the tactical operations center (TOC) to accomplish airspace management. The AME, normally manned by an aviation officer and an air defense officer, does not have the manpower or equipment to manage the division's airspace. FM 1-60 further states that the brigade commander, using his present staff, will accomplish airspace management. FM 1-60 refers to brigade airspace management personnel but does not specify who these people are. The brigade aviation officer has been removed, leaving no aviation expertise on the brigade staff. The brigade commander and his subordinate commanders are called upon to give pilots detailed briefings on airspace procedures to be followed in their areas of operations. They also charge the pilots to see and be seen when operating in the brigade airspace. This concept is impractical on today's battlefield.

Current doctrine establishes a network of flight operations centers (FOC) and flight coordination centers (FCC). These are located in the corps or division rear area for airspace control within controlled airspace such as corps or division airfields. They are also charged with providing terminal and en route air traffic control, navigation aids, air warnings to aircraft, and other assistance to aircraft operating in their area. The enemy ADA threat will force all Allied aircraft down on the deck, flying nap-of-the-earth (NOE) in the tactical operations area. The FOC at corps and FCC in the division rear will not be able to talk to aircraft operating NOE in the brigade forward areas with existing communications equipment. Tactical teams, as currently authorized for wartime operations, are not available today and could not provide airspace management in the forward area if they were available. A division will fight as it trains, that is, without tactical teams for airspace management in the brigade areas.

An aggressive aviation officer in the AME can develop a tremendous amount of data but cannot disseminate the data on a timely basis to all users. Therefore, the assistant division aviation officer becomes frustrated and becomes an aircraft scheduler. Brigade commanders are concerned with fighting outnumbered and winning, which must be their primary mission. This circumstance has resulted in airspace management being generally ignored below the division level. Unless the brigade commanders are aviators, they are usually unaware of their airspace management responsibility. Additionally, there are neither training tables nor ARTEP standards to measure the proficiency of the airspace managers.

An analysis of airspace management SOPs from each of the Army's active divisions and US Army Europe provided numerous excellent ideas. However, the SOPs were either in draft or simply parroted most of FM 1-60. Each SOP was different. The procedures to be followed by all airspace users changed from division to division. Aviation units moving among divisions will experience total confusion. Airspace management will be difficult if not impossible if there is no standard of control.

In January of 1979 the commanders of the 9th Aviation Battalion and the newly formed 9th Division Air Defense Artillery (DIVADA) formed a joint air battle management operations (ABMO) staff. This was done to continue the development of an airspace management system for the 9th Infantry Division. To establish a common point of reference and understanding, the ABMO effort focused on the language in the definition of airspace management: the *coordination, integration,* and *regulation* of the use of airspace of defined dimensions. According to FM 1-60, coordination is that degree of *authority* necessary to achieve effective, efficient, and flexible use of airspace. Integration considers the *necessity to consolidate requirements* for the use of airspace. Regulation indicates *the requirement to supervise* activities in this airspace to provide flight safety.

The ABMO staff then addressed the five airspace management functions specified in FM 1-60.

- Coordinate the use of airspace.
- Coordinate Army Air Defense Artillery operation.
- Coordinate Army air traffic.
- Provide information on aviation status and recommend the allocation and reallocation of Army aviation resources.
- Provide intelligence obtained through air defense channels.

The capability of the maneuver unit commander to accomplish the airspace management functions varies from the battalion level to division level. With the exception of functions three and four, none of the airspace management functions is regularly accomplished in the division area.

Having established a point of reference and settled on the functions of airspace management, the ABMO staff examined the critical information essential to airspace management in the tactical operations area. This area extends from the division and brigade rear areas forward to the covering or screening force below the coordination

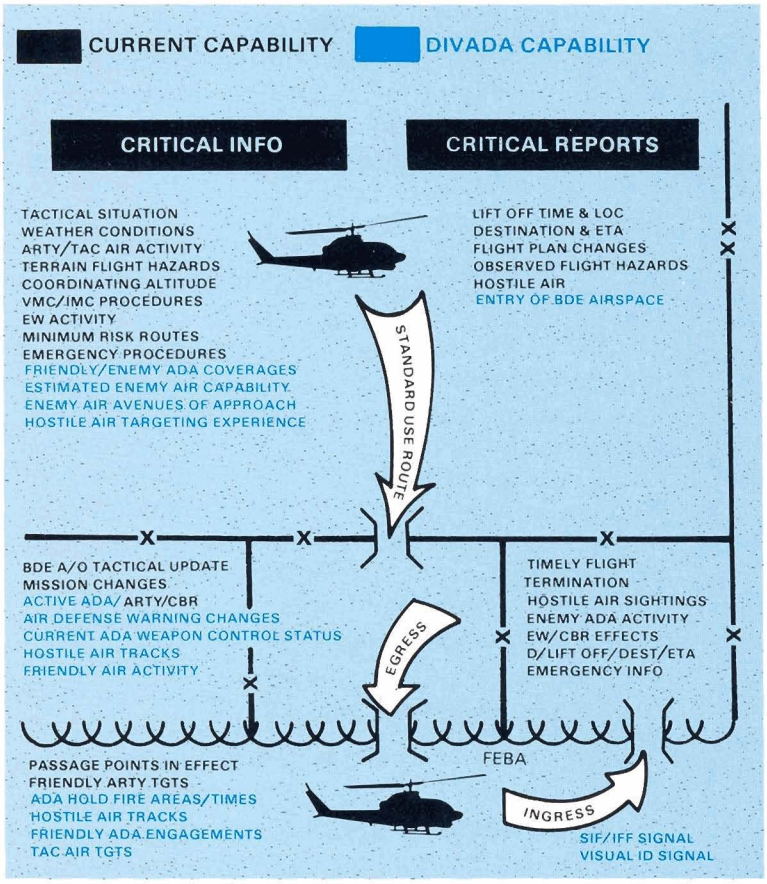


Figure 1.

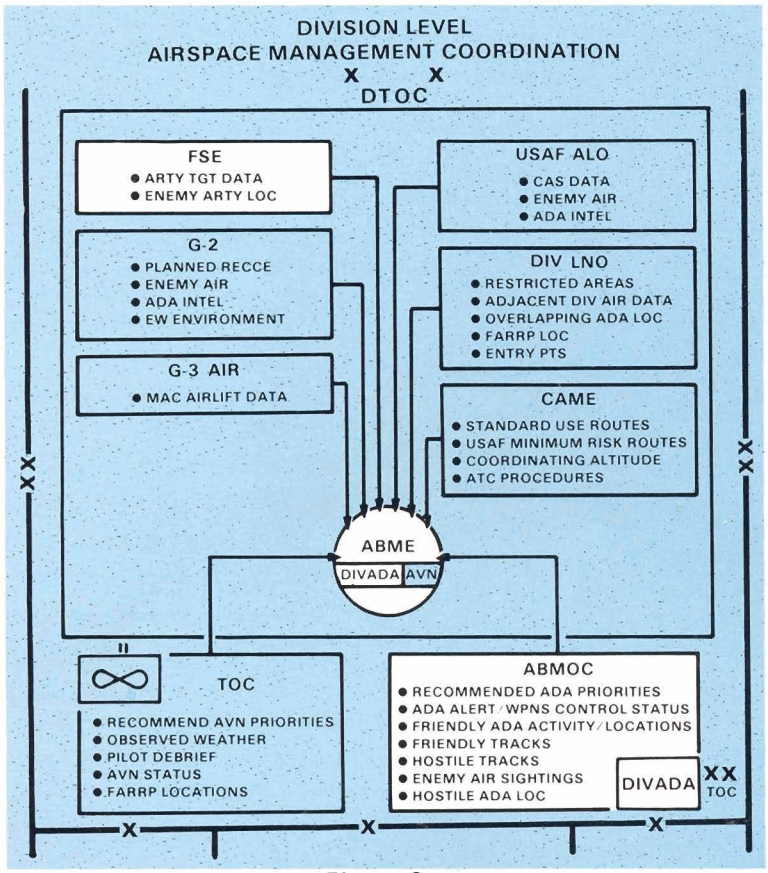


Figure 2.

altitude. Although not all inclusive, figure 1 lists the data required in each section of the tactical operations area. The chart is arranged with those functions that are in the division rear at the top; preflight data and the data needed by the airspace manager are in the left column. The right column lists data required from the pilot in flight. The areas printed in black can normally be accomplished now by a pilot during his preflight planning or by radio to an FCC in the division rear. As the pilot leaves the division rear and enters the brigade airspace, he may not be able to receive any data by radio from the FCC while en route. The pilot must follow the division SOP while flying from the brigade rear to a forward battalion. He must monitor the supported unit's radio frequency until within range to receive an update and landing instructions. Upon completion of his mission in the forward area, the pilot follows the SOP in his return to the division rear until he can again contact an FCC for an en route update.

The areas printed blue on the chart indicate the increased airspace management capability and near real-time information exchange that can be achieved in the 9th Infantry Division through the command, control, and communications (C^3) afforded by the 9th Division Air Defense Artillery (DIVADA). To overcome the shortcomings identified and incorporate the capabilities of DIVADA into an airspace management system, Reliable Shield was developed. *Reliable* is for the Old Reliable of the 9th Infantry Division and Shield stands for Swift Helicopter Identification Expedient Locating Display.

In returning to the definition of airspace management, the first requirement is to coordinate. The 9th Infantry Division has formed an air battle management element (ABME) within the division and brigade TOCs (shown on the chart, fig 2). This element is composed of S2 and S3 representatives from the DIVADA staff along with the division aviation officer's representatives. This special staff coordinates directly with the other staff sections within the DTOC. It also coordinates with the corps airspace management element (CAME), adjacent divisions, the organic aviation battalion, the cavalry squadron, and any attached aviation assets. Thus, it determines who plans to use the division airspace and how and when they plan to use it.

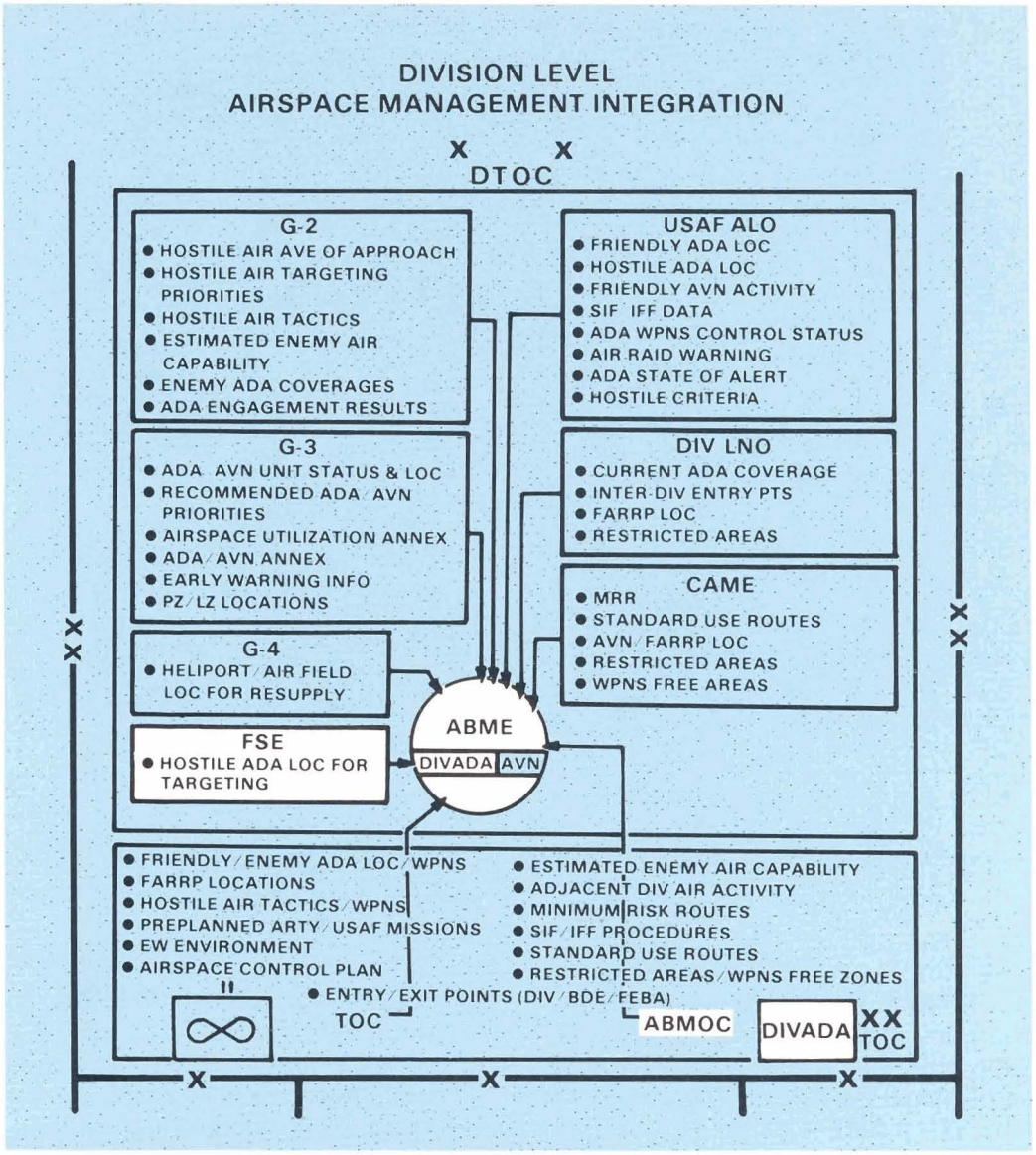


Figure 3.

The ABMOC (fig 2) is the air battle management operations center and will be covered in detail later.

Having effected coordination with the users of the division's airspace, the ABME implements the second requirement of airspace management, integration, by consolidating the requirements and resolving any conflicts either directly with the division commander (the airspace manager) or his G3. The ABME then disseminates the data that may impact upon all airspace users (fig 3).

The third concern of airspace management is regulation. To supervise the 9th Infantry Division airspace, the DIVADA air battle management operations center (ABMOC) was established and staffed by air defense artillery and aviation personnel. The function of the ABMOC is to accomplish early warning and airspace management for the division through the receipt, correlation, and dissemination of tactical air battle data. Figure 4 shows the information flow among the corps aviation FOC, the Air Force control and reporting center (CRC) and forward air control point (FACP), the 9th Infantry Division and brigade ABMEs, the FCC, and the pilot. This can be accomplished by locating the DIVADA TOC, the direct support Hawk battalion AN/TSQ-73 (C^3), and the doctrinal FCC liaison officer (LNO) with the ABMOC.

The communications system required for this airspace management system is shown in figure 5. It will work in any division. It has been slightly modified to represent the Air Defense Artillery structure by which the 9th Infantry Division was organized during Brave Shield 20. All

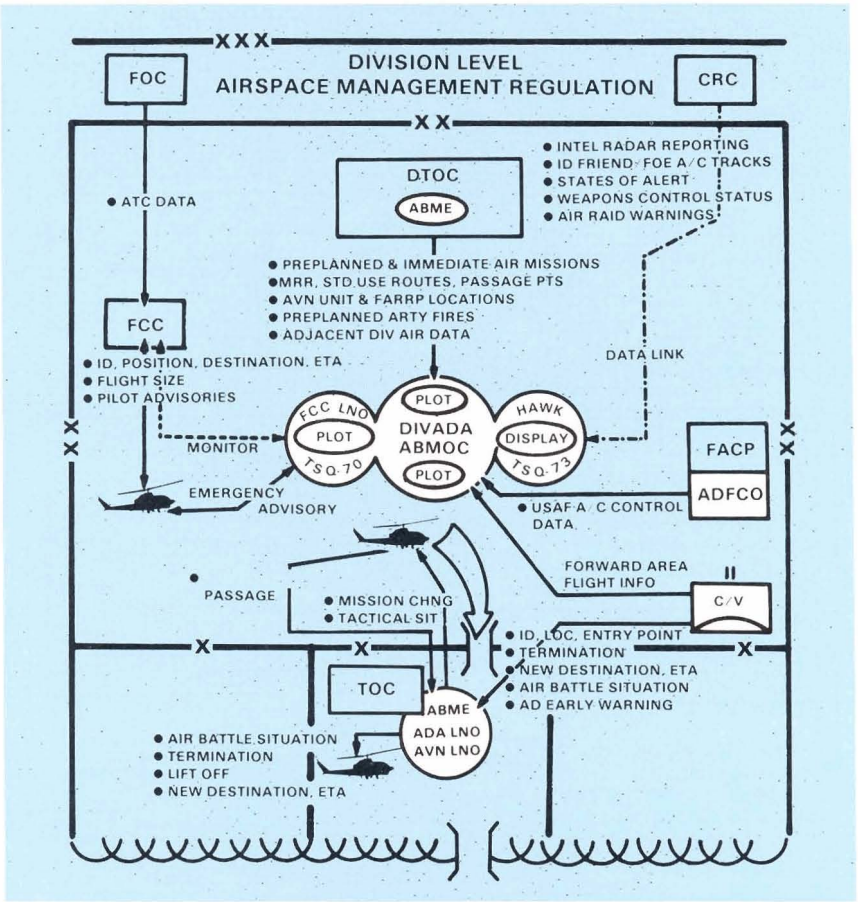


Figure 4.

communications links for air defense are not shown in this figure. The communications links shown are for a division-type structure and represent those links that will handle the majority of the air traffic. The ABME section in the brigade area is made up of an ADA officer and an aviation liaison officer serving as special staff members to the brigade commander for airspace management.

A pilot taking off from an airfield in the division rear in this environment would initiate *flight following* with the appropriate FCC. His call would be monitored by the FCC LNO (who has received planned data from the DTOC ABME through the ABMOC) and a track would be initiated on the friendly aviation plotting board to "visually" *follow* the aircraft through the area of operations. The pilot would follow a standard route through the division rear to an entry point in the brigade rear area. Upon entering the brigade area, he would terminate *flight following* with the FCC (be monitored and the track updated at ABMOC) and initiate *flight following* with the brigade ABME. The brigade ABME would provide an en route update to the pilot and provide present position data of aircraft operating in the brigade area to the forward ADA C/V battalion. The battalion would, in turn, pass the data to the ABMOC for a track update. The ABMOC could then either update the FCC on the status of any aircraft in the area of operations or notify the parent unit. When returning to his home base in the division rear, the pilot would simply reverse the process. Air Force aircraft planned data would be passed from the DTOC ABME to the ABMOC. As an Air Force aircraft moves from the corps area to the division area, the ABMOC monitors its progress through communications links with the CRC and FACP and also monitors the aircraft tracks with the Hawk AN/TSQ-73 radars. Conflicts with Army aviation can be detected and emergency instructions to either aircraft issued by FCC LNO, who has both a monitoring and transmitting capability with the AN/TSC-61B flight coordination center shelter. Note that an AN/TSQ-70 (air traffic control center) was used during Brave Shield 20 and is shown in each figure as being located with the FCC LNO at the ABMOC. The AN/TSC-61B is the equipment designed for this mission.

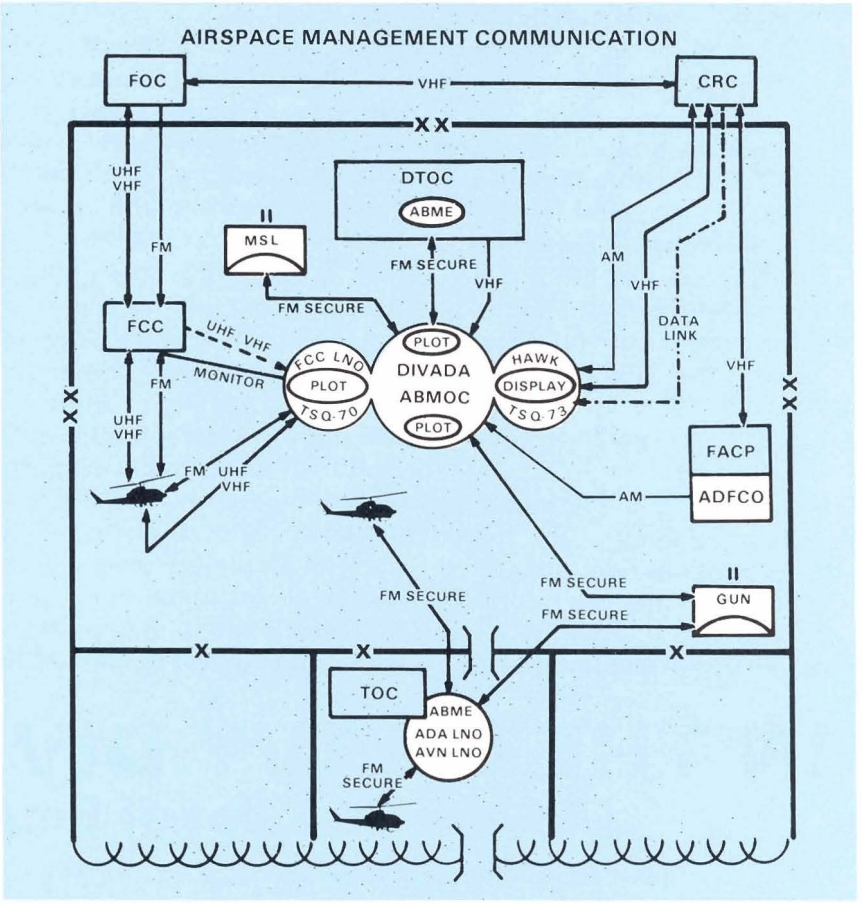


Figure 5.

The Reliable Shield system for airspace management does work, demonstrating a capability to manage division airspace forward of the brigade rear boundary. During Brave Shield 20, the ABMOC flight followed and "tracked" 612 aircraft sorties and coordinated more than 10 penetrations of the coordination altitude. At one point during the exercise, the ABMOC was able to request and receive clearance for ADA units to go "weapons free" on helicopters at night when all friendly helicopters had terminated their flights. This proved to be valuable. It resulted in three enemy aircraft being engaged and turned back by ADA fire units. The information provided to airspace users was timely and accurate. The airspace users found that the communications link with the aircraft in flight enhanced the procedural, visual, and electronic means of identifying friendly aviation in the tactical operations area.

Reliable Shield, the 9th Infantry Division airspace management system, is a basic system. Employing the system, the division commander (as the airspace manager) can coordinate, integrate, and regulate the use of the division airspace. Reliable Shield can be readily adopted for use throughout the Army, NOW!

Major Long graduated from Emory Riddle Aeronautical University with a degree in Aeronautical Science. A senior pilot and graduate of the ADA Officer Advanced Course, he has served as C/V battery commander and in various ADA battalion staff positions. He is currently serving as Executive Officer, 1st Battalion, 67th ADA, and Aviation Officer of the 9th Infantry Division, Fort Lewis, Washington.

Editor's Note. We remind our readers that the disclaimer preceding "Reliable Shield" applies equally to this article.

To improve the air defense posture of the 4th Infantry Division (Mech), the 4th Battalion, 61st Air Defense Artillery, is being reorganized into an Air Defense Artillery Battalion Group. This action was initiated because two different air battles can be expected simultaneously over the division area of operations. One could occur over the covering force and main battle areas (consisting chiefly of armed helicopters) and the other over the division rear area (consisting of high-performance aircraft).

Because the capabilities of Vulcan, Chaparral, and Redeye are short range and because of the way they are deployed, the commander's ability to manage aviation and air defense operations effectively is degraded. The risk of friendly air defense engaging friendly aircraft has increased to an almost unacceptable level. Adequate command and control measures to optimize the capabilities of both forms of combat power do not exist. Therefore, it will be difficult to employ aviation and short-range air defense systems safely in the same airspace in any conflict in the foreseeable future. We need an integrated organization that allows full use of the capabilities of both aviation and surface-to-air defense. The principles of centralized control and decentralized execution, applied through a responsive command and control organization, will increase the effectiveness of the total force.

Current doctrine and the amount of equipment on hand (24 Chaparral systems, 24 Vulcan systems, and 62 Redeye teams) reduce the adequacy of the coverage of this division, particularly for its support elements. Hence, action is required to reduce the division's vulnerability to the formidable air threat.

Just as Soviet air power presents a significant threat to US ground forces, Soviet air defense capabilities present a threat to US air operations. However, US operations in the main battle area without prohibitive losses are essential to victory.

The following actions have been taken to prepare for the threat:

■ Coordination with the 11th ADA group, Fort Bliss, Texas, to insure that a Hawk battalion will be designated to assist in the training of this division. Communication with the Forces Command Commander requesting that an M42 (Duster) battalion from the National Guard be designated as a roundout unit to also train and deploy with this division.

■ Although not in accordance with existing doctrine, an Air Defense Artillery battalion group, consisting of a Vulcan command and a Chaparral command, is being formed (fig 1). This battalion group organization could possibly assist the tactical air defense commander in providing the flexibility necessary to defend the different targets of the maneuver and field artillery units and division support elements from the expected aircraft threats. It could provide an acceptable means of implementing the centralized control and decentralized execution required not only for today's battlefield but for battlefields of the future.

ADA IN THE HEAVY DIVISION
(A New Concept of Employment)

by Lieutenant Colonel Domenic P. Rocco, Jr.

Under this concept, the battalion group staff could also serve as the Chaparral command staff. The deputy battalion group commander will wear two hats. Besides serving as the deputy commander, he will act as the Chaparral command commander. The Redeye sections removed from the brigades and division artillery will be assigned to the Vulcan and Chaparral batteries.

The Air Defense Maintenance Section of Company G, 704th Maintenance Battalion, will become a direct support platoon under control of the battalion group maintenance officer.

The Vulcan command will be task organized with Redeye elements to form helicopter killer teams (HELKITS). Using three Redeye teams and two Vulcans, it is possible to form 12 of these helicopter killer teams (fig 2). Four or more HELKITS can be placed in support of a brigade depending on the brigade's mission. It is possible to provide each brigade with four teams simultaneously. The command and control triangular battle formation (fig 3) facilitates side aspect engagement by Redeye and forward aspect engagement by Vulcan in a coordinated manner. This organization could enhance our air defense force that may be required to protect a 100 x 150 km

division area of operations. That is why reorganization is necessary. The ADA battalion group should be able to control the forward battle with a forward command post (CP) (i.e., the Vulcan command) and simultaneously control the rear area battle with a rear CP (i.e., the Chaparral

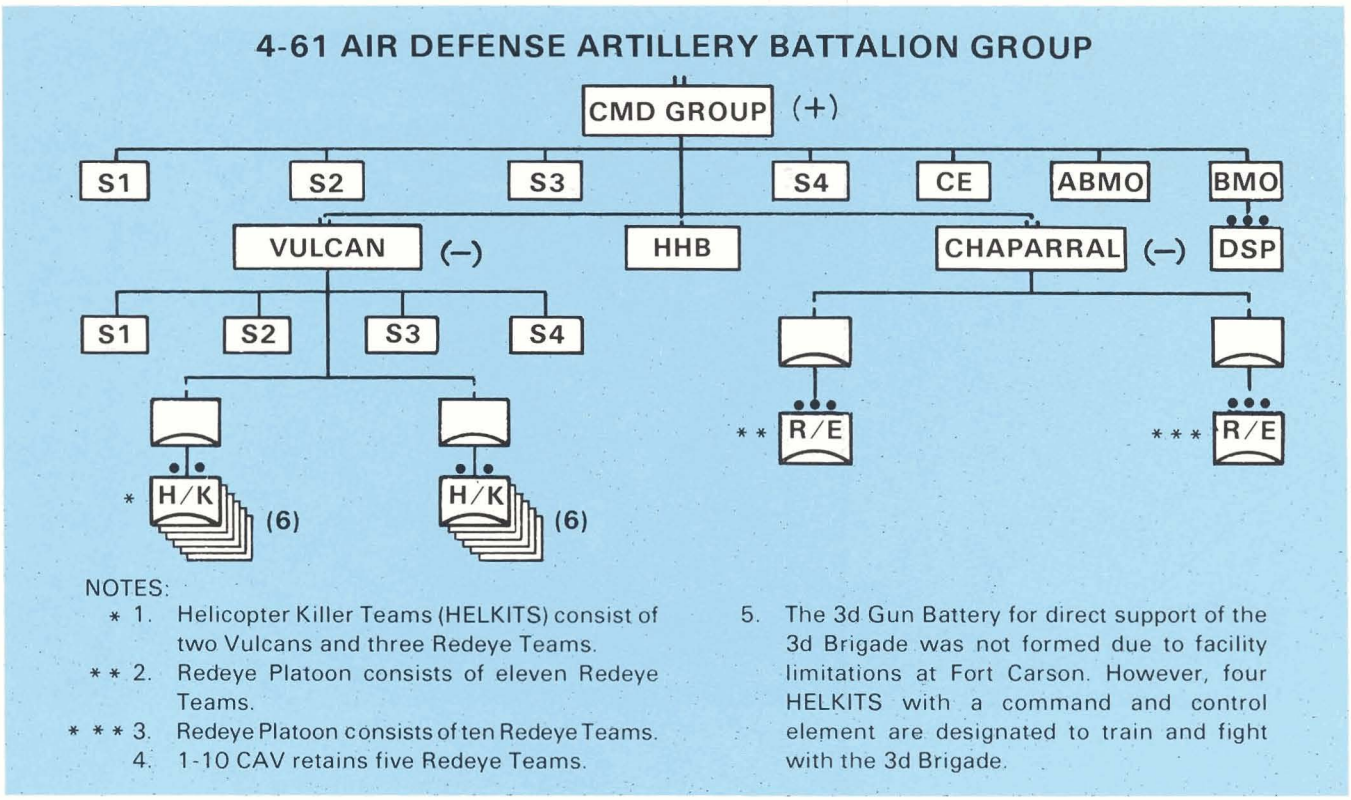


Figure 1.

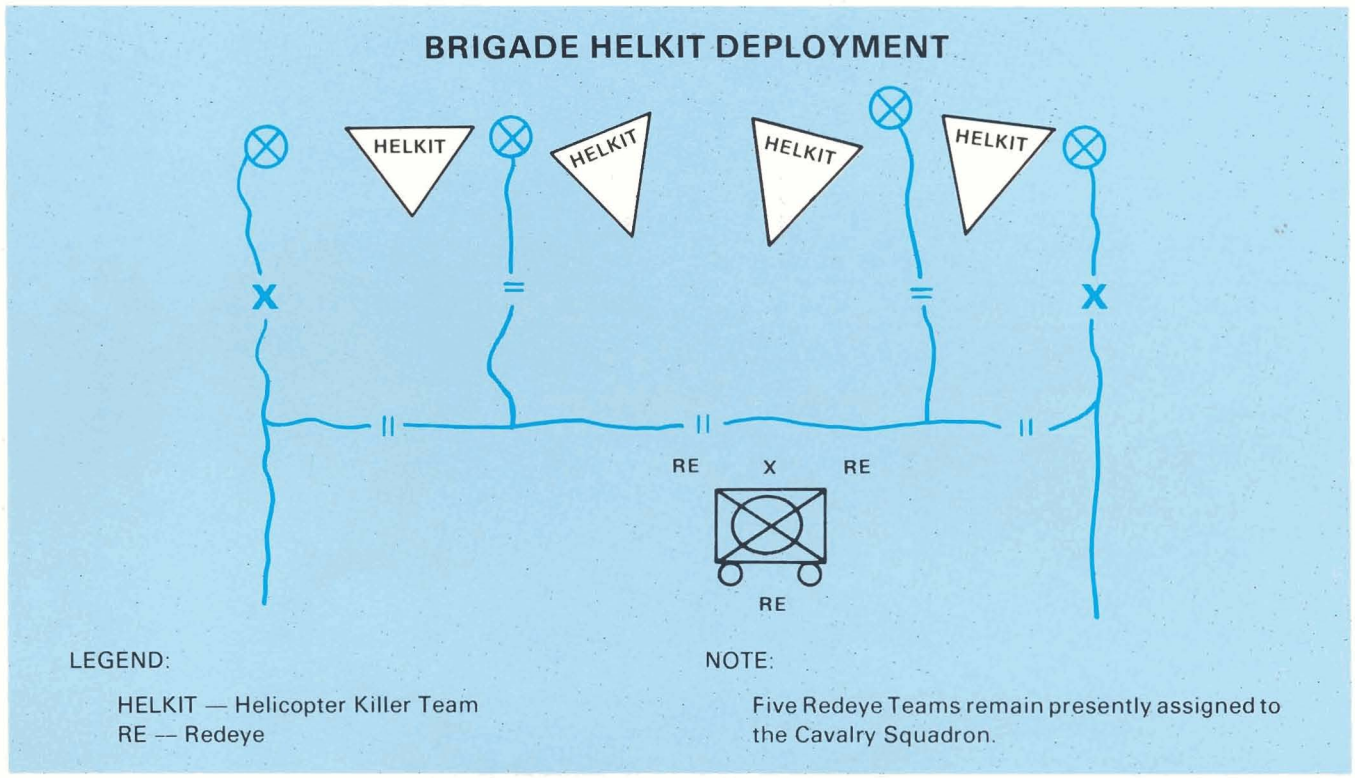


Figure 2.

command). The battalion group Army air defense command post (AADCP) could provide these units administrative and logistical support and air defense planning and early warning, as well as airspace management and control, throughout the division area of operations.

An air battle management operations center (ABMOC), patterned after the 9th Infantry

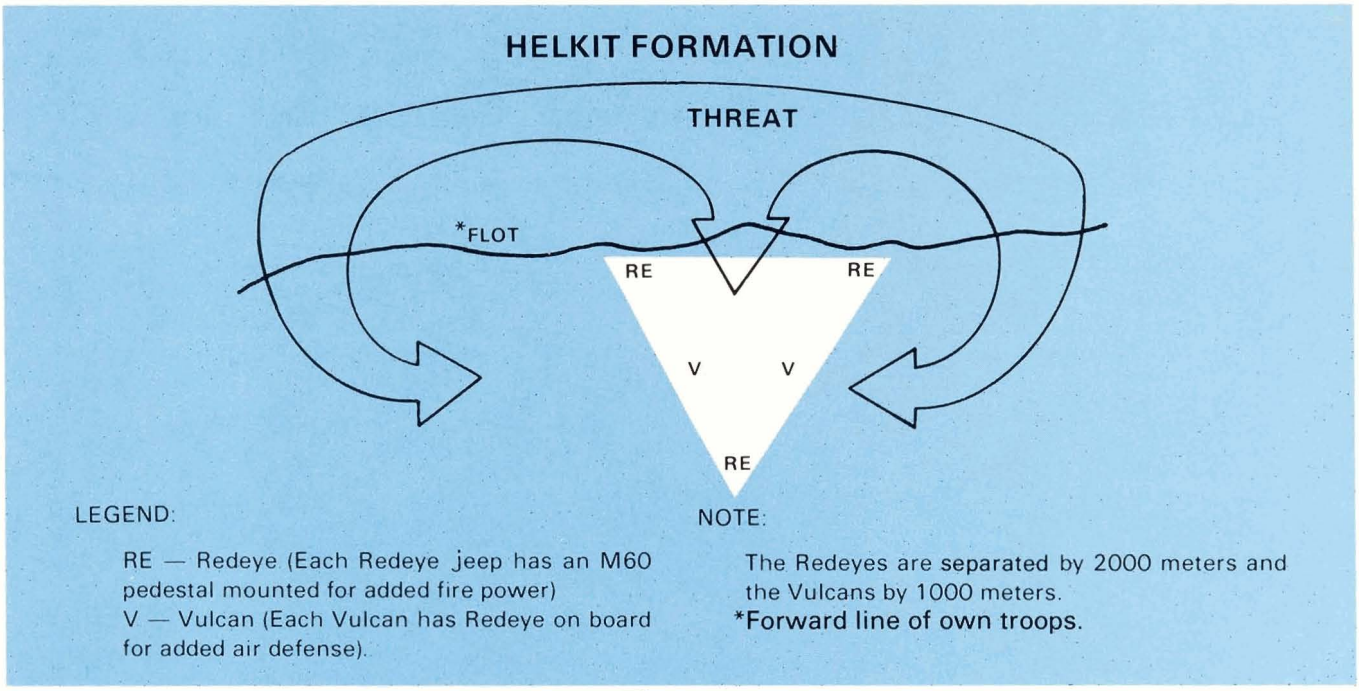


Figure 3.

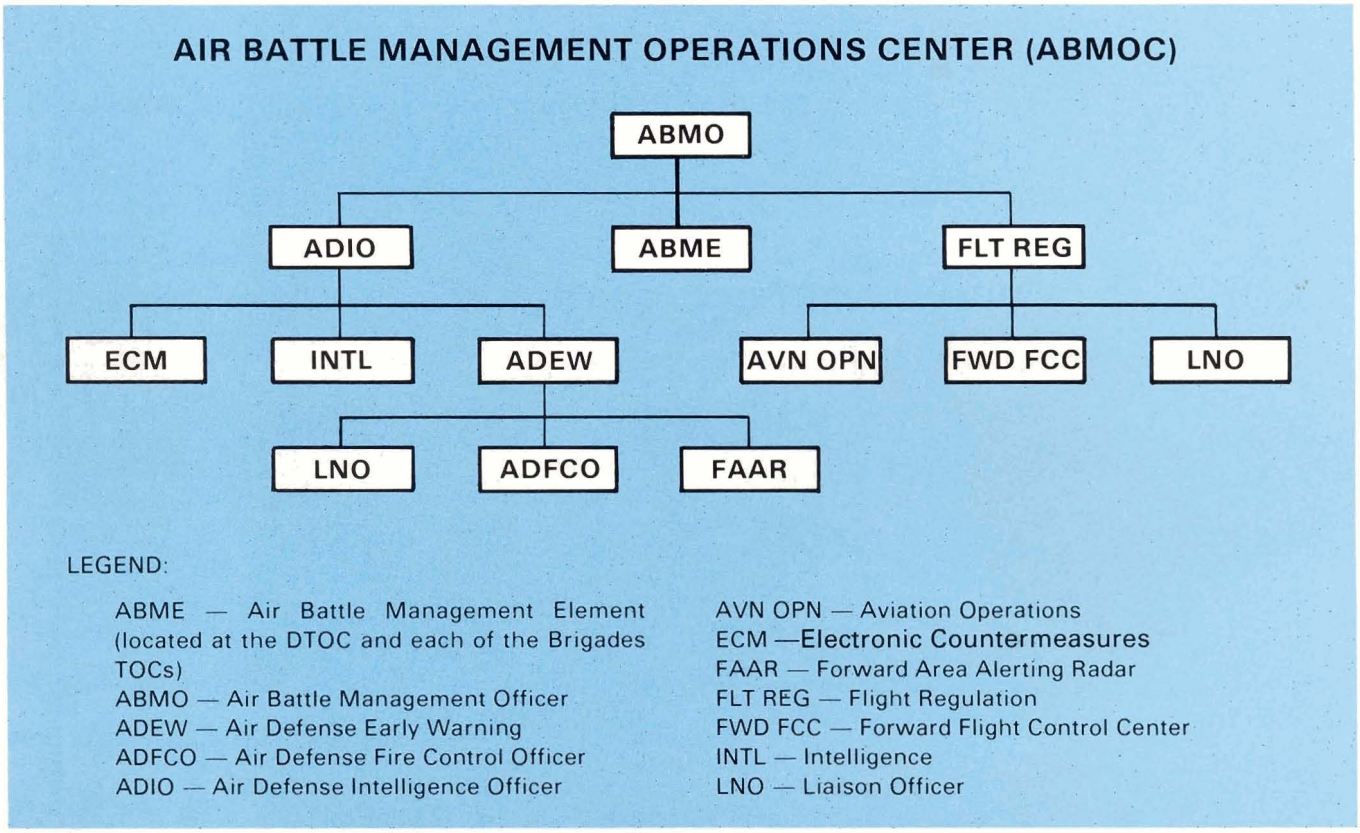


Figure 4.

Division's ABMOC, is being formed. This agency replaces the division airspace management element (DAME) and centralizes all of the division airspace management functions (fig 4). The ABMOC's purpose is to manage and regulate the division airspace on a minute-to-minute basis. Through centralization of all assets that previously relied upon radio and wire communications, we have a method that provides immediate data to Army and Air Force aircraft to either engage or avoid a threat. It also allows this command to locate its air assets at any time. The air battle management element (ABME) through the ABMOC, replaces and expands the capabilities of the DAME. Whereas the DAME is now primarily a planning agency with no capability to manage airspace on a real-time basis, the ABME is able to process immediate airspace management information, as well as enemy air and ground activity. Following the ABMOC concept, developed by the 9th Infantry Division, we at the 4th Infantry Division have incorporated this concept into our operation and reorganization.

The HELKITS concept was tested at Fort Irwin, California, in November 1979, during Mojave Chief, a desert exercise conducted by the 4th Infantry Division (Mech). The concept proved worthy of further study.

During Joint Exercise Gallant Eagle 80, the foregoing concepts were again tested. The HELKITS appeared to be capable of defending both armor and mechanized battalions operating in either the active defense or the attack. The combined Vulcan/Redeye elements, working as a team, kept pace with the maneuver forces at all times. The four HELKITS were credited with 127 aircraft engagements and 99 kills during the 7-day exercise.

Equally successful were the Chaparral missile systems. The fire units experienced a continuous 100 percent operational rate while providing protection to the brigade trains, division tactical operations center, main supply routes, and artillery nuclear delivery units. The coverage provided by the Chaparral and Redeye assets was adequate throughout the FTX, and the crews were credited with 50 engagements and 38 kills.

The formation of the Vulcan command and the Chaparral command, displaced forward and rearward, respectively, proved highly effective in command, control, and coordination during the exercise. The flow of information to the ADA group headquarters was routinely more complete, accurate, and timely.

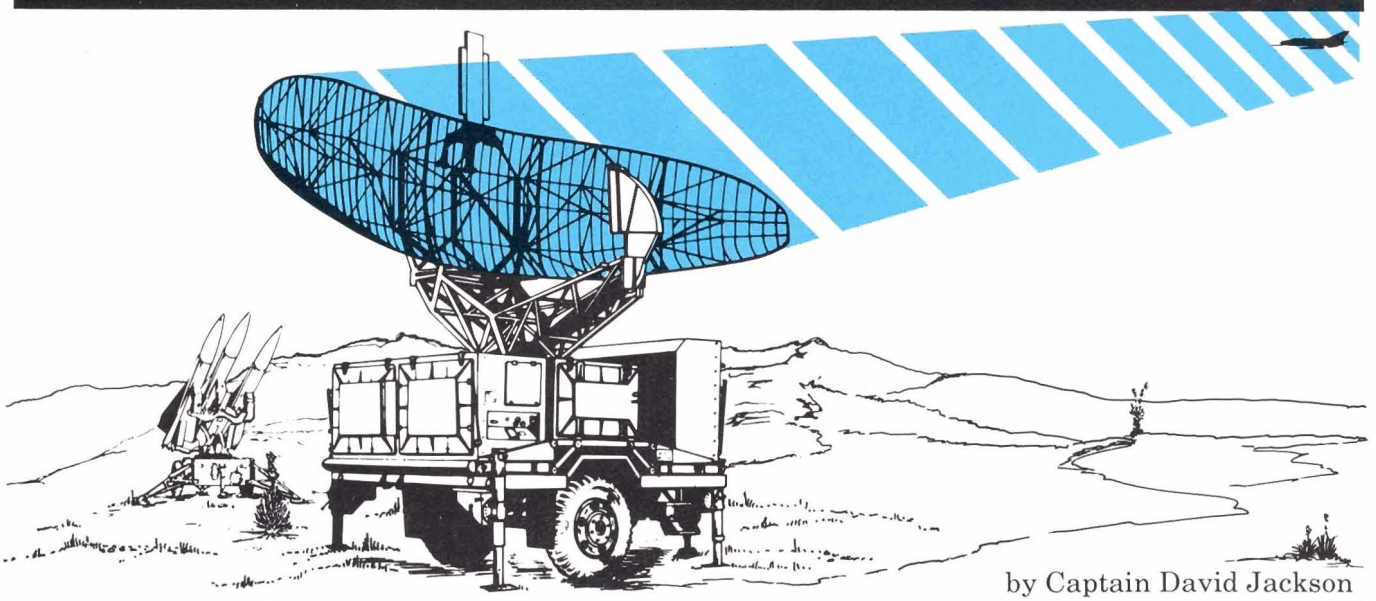
The end product was that I, as the ADA Commander in a heavy division, was capable of influencing the battle. In conjunction with the command and control structure, there were also significant accomplishments in the newly configured ABMOC. This was possible due to the ABMOC and reliable Swift Target Identification Notification Grid (STING) equipment and personnel provided by the 9th Infantry DIVADA. We are in the process of developing this equipment for use in the 4th Infantry Division on a permanent basis.

The coordinated effort to manage airspace during the Joint FTX resulted in valuable training. Units were afforded the opportunity to integrate various systems which involved the 2nd Bn, 55th ADA, 11th ADA Group, with its AN/TSQ-73, and our own FAARs for acquiring aircraft and passing time-sensitive early warning plots. The efforts of the ABMOC enabled nearly 2,000 plots to be broadcast across the division area, including the combat and supporting forces as well as the ADA fire units.

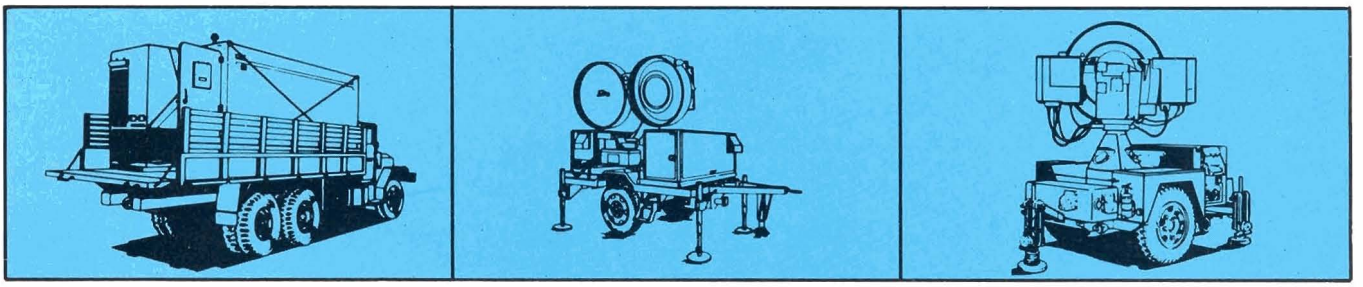
The ABMOC, Chaparral/Vulcan commands, and HELKITS were only concepts prior to Gallant Eagle 80. Now, each segment has been tested in a large-scale tactical operation. Procedures will be further refined and the 4th Infantry Division (Mech) will materially benefit from these concepts as we continue to maximize the use of all our air defense resources.

Lieutenant Colonel Rocco graduated from the University of Nebraska at Omaha where he majored in Business Economics and was named to two national societies for academic excellence. He has been selected to attend the Army War College in 1980. He has experience in command and staff positions in Field Artillery and Air Defense Artillery in the US and Korea and has held special assignments in Vietnam with Headquarters, 4th Infantry Division, and at Headquarters, Department of the Army.

HAWK RADAR EMISSION CONTROL PLAN



by Captain David Jackson



In the July-September 1979 issue of AIR DEFENSE Magazine, an article was printed under *Scanning* entitled "Certain Sentinel." It detailed the participation of the 11th Air Defense Artillery Group Augmentation Force in REFORGER 79. At the 1st Battalion, 65th Air Defense Artillery, Fort Bliss, Texas, we read with interest the list of valuable lessons learned by the 11th ADA Group during that exercise. The first item on the list emphasized the need for a radar emission control plan to enhance survivability of the Hawk battery.

In the spring of 1979, at Key West, Florida, our battalion conducted numerous field problems leading up to Hawk battery ARTEP evaluations. In all of the field training exercises, the batteries performed various methods of "Snap Shooting" tactics. Prior to ARTEP evaluations, the battalion warrant officers got together and used their lessons learned to develop a standard procedure for "Snap Shooting." Part of this procedure effectively controls radar emission.

Although the 1st Battalion, 65th ADA, plan has never been formally tested by any agency, we did execute the plan in two ARTEPs. It was found to be completely workable. So this plan we submit is a product of trial and error. It is based on the technical aspects of the Hawk equipment, known radar patterns, and the fact that well-maintained equipment will respond when called upon. Comparing known Hawk front, side, and rear lobe patterns with the enemy's capability of detection, it becomes obvious that the most logical orientation of radars should be parallel to the FEBA in almost all tactical situations. Such positioning is contrary to the Hawk practice of placing the HIPIR on the primary target line (PTL). We feel that sacrificing less than 1 second of transfer time is not worth an incoming round.

This plan is submitted with the hope that other Hawk battalions find it useful and, more importantly, with the idea of soliciting constructive criticism so that we may improve the concept and further our chance for survivability on the battlefield.

The following steps are not listed in any required order of accomplishment. In reality, many are occurring simultaneously.

Phase I.

■ Upon entering an area, emplace and aline while maintaining radar silence.

■ Establish communications with higher headquarters.

■ Tactical control officer (TCO) plots the latest trace of the FEBA on the tactical control console and fire control consoles.

■ TCO determines azimuth bearing parallel to the FEBA and passes azimuth on to all radar operators.

■ Necessary checks to prepare the following equipment for firing are performed using the appropriate technical manuals.

☐ Battery Control Central (BCC).
☐ Platoon Command Post (PCP).
☐ Control Central (CC).
☐ Launchers.

■ Continuous-Wave Acquisition Radar (CWAR):

☐ Request parallel azimuth for FEBA from the TCO. With grease pencil, mark azimuth on azimuth vernier mil ring and on azimuth handwheel assembly.

☐ Check out with local synchro (antenna) pointed parallel to the FEBA. Conduct only the following checks listed in TM 9-1430-528-12-1: tables 3-0.1 through 3-14 (steps 11c and 12J) and table 3-15 (steps 1 through 3).

■ High-Powered Illuminator Radar (HIPIR):

☐ Antennas will be positioned on a line parallel to the FEBA similar to the CWAR.

☐ When the antenna is properly positioned, the radar will be brought only to false radiate status for checkout.

☐ While in false radiate status, conduct only the checks in tables 3-1, 3-2, 3-3, and 3-4 of TM 9-1430-533-12-1.

■ Pulse Acquisition Radar (PAR):

☐ Antennas will be positioned on a line parallel to the FEBA similar to the CWAR and brought only to standby status.

☐ While in standby status, only the checks in table 3-14 of TM 9-1430-534-12-1 will be conducted.

■ Identification, Friend or Foe (IFF), will be checked out using only the test pattern (nonrotate).

■ Range-Only Radar (ROR) will be brought to full radiate status and all prescribed checks (except the antenna load check) will be performed.

Phase II.

When all Phase I actions have been completed and *only upon direction from the TCO*, the following may be accomplished:

■ With the PAR antenna positioned on a line parallel to the FEBA, the PAR will be brought to full radiate status (nonrotate) and checked out using only table 3-15, less step 3, and table 3-16, less step 1, of TM 9-1430-534-12-1. Maximum allowable time is 2 minutes. As soon as checks are completed, the PAR will be taken to standby status and remoted to the BCC.

■ When the PAR checkout is completed, the HIPIRs will be checked out one at a time, if possible. The HIPIRs will be positioned on a line parallel to the FEBA with the elevation handwheel at a minimum of 1,100 mils. They will be brought to full radiate status and checked out using table 3-5 (step 2, step 3a-1, 2, 3, 4, and step 6) and table 3-18 (step 12, A, B,C, D, L, M, N, and O) of TM 9-1430-533-12-1. Maximum allowable time per radar is 2 minutes. As soon as checks are completed, each HIPIR will be taken to remote standby with the antenna parallel to the FEBA and the elevation set at a minimum of 1,100 mils.

The battery (or assault fire unit) is now ready for action with a minimal emission time and exposure to detection.

We'd like to hear your comments and suggestions for improvement. Send your remarks to the 1st Battalion, 65th ADA, Fort Bliss, Texas 79916.

Captain Jackson graduated from West Point with a degree in Nuclear Engineering. He commanded a Hawk battery in Korea before joining the 1st Battalion, 65th ADA. His most recent assignment was Assistant S3 of that battalion. He recently resigned from the Army to accept a job with Westinghouse in nuclear plant operations.

WHAT DO YOU DO NOW,

LIEUTENANT?

Prepared by Tactics Department, USAADS

by Major Alistair D. Ross, RNZA

SITUATION:

First Lieutenant Smith is Assistant Operations Officer, 1st Battalion (C/V), 141st Air Defense Artillery, 35th Infantry Division, Hawaii. One month prior to a US/New Zealand/Australian, divisional level, command post exercise (CPX), Lieutenant Smith was tasked by his S3, Major Carr, to prepare notes for a presentation on the use of small arms for air defense to be given to officers attending the CPX.

The following guidance was provided by Major Carr: "The audience will comprise non-US officers representing infantry brigade/battalion staffs and armored/artillery and engineer staffs. They will be interested in basic doctrinal principles so they can make comparisons and possibly adopt some of our principles/techniques into their training. I will preview your notes 7 days prior to finalizing a presentation for the battalion commander. Make sure you include some graphics, and keep it short."

Lieutenant Smith reflected on some of the information he had gained while he attended the ADA Officer Basic Course at Fort Bliss, Texas, and decided to develop his notes using the following framework:

- Highlight a need for small arms air defense.
- Briefly discuss some fundamentals of aerial target engagement with small arms.
- Briefly discuss the application of small arms engagement techniques.
- Highlight some elements for inclusion in standing operating procedures (SOPs).

A fully comprehensive discussion on the subject was negated.

The Need For Small Arms Air Defense.

The opinion persists among many officers that the effect of firing small arms at enemy aircraft is limited to the morale boost it gives the troops doing the firing. Those who adhere to this view cannot claim to be valid students of recent military history.

- In the Korean conflict, the US Air Force lost 544 aircraft to combined small arms and air defense fire, almost 5 times as many aircraft as were lost in air-to-air combat.
- In South Vietnam, 410 fixed wing aircraft and 2,100 helicopters were shot down by small arms. Small arms also contributed to a significant number of aircraft losses over North Vietnam.

■ During the 1973 Middle East War, units of both sides used small arms weapons to drive off, damage, or destroy attacking aircraft.

The wealth of evidence available in recent publications should help to refocus thoughts on the subject. There certainly is more than just morale-boosting significance in small arms air defense fire.

Although in the maneuver force area the goal of air defense is to prevent enemy aircraft from interfering with the conduct of our ground operations, complete achievement of this goal may not be feasible or indeed possible. Even though our air defense weapon systems are designed to destroy all types of enemy aircraft, there may never be sufficient assets to provide total protection over the entire battlefield.

The enemy aircraft that we cannot destroy must be deterred from pressing home an attack or be distracted sufficiently to nullify the intended effect on a target. Small arms fire can play a significant part in the achievement of this aspect of air defense. Such fire can supplement that of air defense artillery or, if necessary, be used as a measure on its own. But random or indiscriminate fire by small arms will not provide an answer. Basic fundamentals and techniques must be employed.

Fundamentals of Aerial Target Engagement.

Small arms weapons by their very nature have limited range capabilities. For example, the effective aerial target engagement range for the M16 is approximately 350 meters and that of a .50-caliber machinegun is in the vicinity of 750 meters. Engagement by small arms, therefore, is limited to low-flying aircraft in proximity to ground troops.

The threat within small arms range will probably be posed by reconnaissance, antitank, and troop-carrying helicopters or fighter aircraft making passes over or transiting the area.

VOLUME OF FIRE is the basic rule.

As one Israeli division commander said, "Put up a large volume of fire with small caliber weapons. Accuracy is not important--volume is."

Naturally, volume is best attained by firing as many weapons as possible into a particular section of airspace for a specific time period. To this end, in view of small arms range restrictions, the most desirable fire is that generated by a squad or platoon, centrally controlled by squad or platoon leaders.

Engagement Techniques.

You may wonder why no mention has yet been made of aimed small arms fire. As a technique, it has not been discarded, but its use is limited. Small arms in air defense has a universal application on the battlefield. Training in its application is needed by all troops, regardless of branch. It is assumed, therefore, that any technique intended for such general use must be *simple,* require *minimal training time,* and need *no special equipment.* Such a premise negates the use of an aimed fire technique against an air threat.

The volume fire technique requires only that the soldier be familiar with basic small arms firing positions, be oriented towards the threat, be capable of estimating lead, and then be capable of firing his weapon on order.

The question of lead application has been a vexing one. Lead will vary according to the nature of the threat and may change depending on profile. A simple method of estimating lead distance is necessary. For high-speed or jet aircraft, an aim-off lead forward of crossing (or overhead bound) aircraft of an estimated two football field lengths should be used (fig 1). For rotary-wing and propeller-driven aircraft, a lead of

HIGH-SPEED OR JET AIRCRAFT

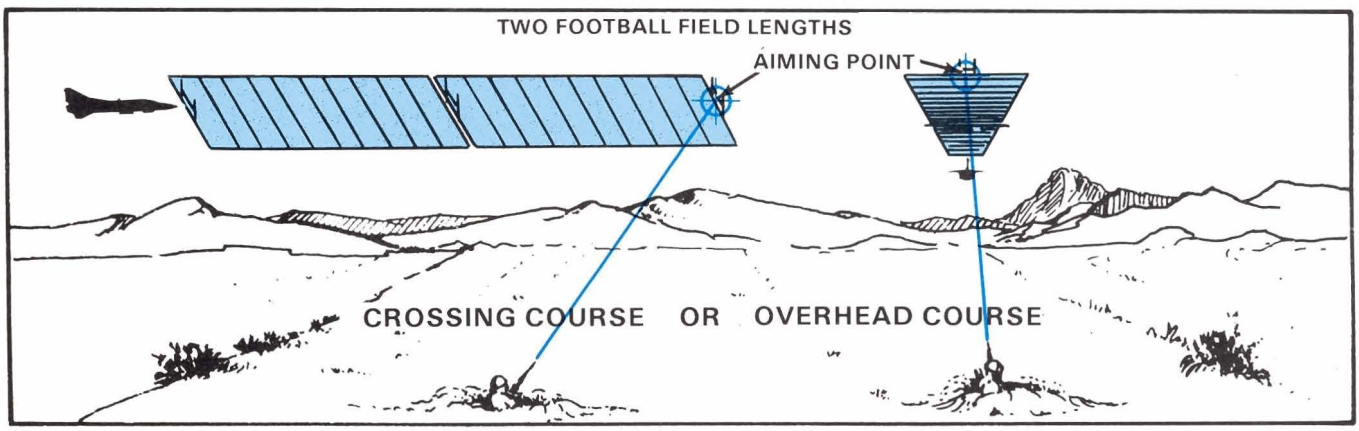


Figure 1

one-half football field length should be applied (fig 2). Most soldiers can easily picture lead lengths in terms of a football field.

The only times no lead need be applied are when the threat aircraft is directly in-bound (in which case the firer must aim slightly above the aircraft nose) or for hovering helicopters (when the aim **must be directly at or slightly above the aircraft).**

It is important that, once the lead distance has been estimated, all weapons are pointed at an aiming point and volume fire is delivered at that point until the aircraft has flown past the point (fig 3). The firer must maintain the aiming point, not the lead distance, throughout the engagement.

Input to Standing Operating Procedures.

Not all aircraft in the forward area will be hostile. Guidance to avoid engagement of friendly aircraft must be given to squad and platoon commanders. This guidance is probably best standardized in a tactical SOP. Commanders at all levels must be aware of command policy regarding small arms air defense in both offensive and retrograde situations. It is absolutely imperative that they become thoroughly familiar with HOSTILE CRITERIA and RULES OF ENGAGEMENT.

Aircraft directly attacking a unit or subunit may be engaged regardless of other guidance. The right of self-defense is never denied. However, such a situation presents the only occasion when soldiers do not require an executive order to fire their individual weapons against aircraft. At all other times, command policy, hostile criteria, and rules of engagement must apply.

ROTARY WING AND PROPELLER-DRIVEN AIRCRAFT

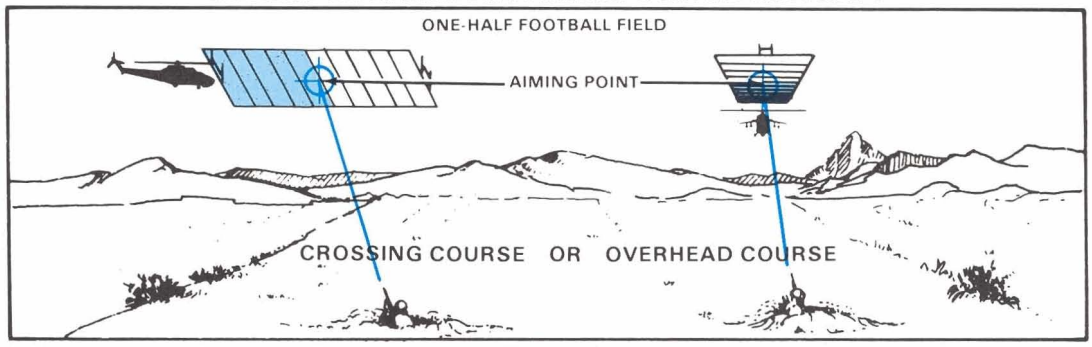


Figure 2

VOLUME OF FIRE

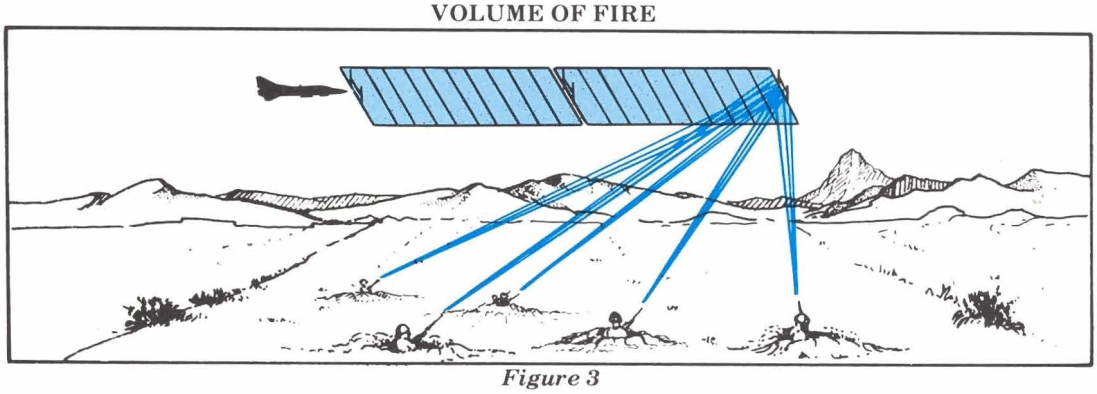


Figure 3

Major Alistair D. Ross, of the Royal New Zealand Artillery, received his formal education in Aukland, New Zealand. He served in Vietnam from 1969 to 1970 and, more recently, was assigned as an Assistant Director of Defense Intelligence in Wellington, New Zealand. Major Ross is currently an exchange officer and senior instructor with the Tactics Department, US Army Air Defense School, Fort Bliss.

LESSONS IN FIGHTING OUTNUMBERED

by Captain C. E. Harrison

As a blue war gamer for the Scenarios and War Gaming Directorate, Command and General Staff College, I often wondered what lessons the Germans learned in attempting to fight outnumbered on the Eastern Front during the last few years of World War II. Between 65 and 75 percent of the German forces were deployed on the Eastern Front against the Soviet forces. Although many things have changed, most of the lessons the Germans learned still seem applicable to any future war on a similar front.

A study of the Eastern Front during World War II indicates that it is possible to fight outnumbered effectively. However, many of the innovative and necessary tactics used by the Germans during some of their successful operations have been overlooked in current US doctrine. Recently, Brigadier General Kahalani, who commanded an Israeli tank battalion in the Golan Heights during the 1973 War, recommended that the United States Army put more emphasis on studying the armored and mechanized battles of World War II to recover forgotten lessons that may be critical to a defense of Europe.

A recently published "How-to-Fight" manual, FM 6-20, Fire Support in Combined Arms Operations, contains a quote from Marshal Maurice de Saxe: "It's not the big armies that win battles..... It's the good ones!" Unfortunately, the United States and its NATO Allies must be prepared to fight a good as well as a big army.

One lesson from World War II cannot be overlooked. When given a free hand, German commanders were quite capable of conducting successful operations against superior Soviet forces. Virtually all of the senior German commanders who survived World War II felt that the war could have been won, even after the catastrophe at Stalingrad. Adolf Hitler, a veteran of the trench warfare of World War I, could not accept the idea of the "flexible" or "zone" defense which many of his best commanders endorsed during the last 3 years of the war. He consistently gave "hold at all cost" orders or postponed decisions on strategic withdrawals until it was too late. As a result, 23 divisions belonging to Count Von Paulus' Sixth Army were encircled at Stalingrad. In 1943, Army Group Center was ordered to construct fortifications rather than use its mobility against Zhukov's offensive. Twenty-eight divisions were annihilated. Even when freedom of action was granted in time to prevent encirclement, the delay in using flexible tactics resulted in higher casualties than necessary. Ironically, the best evidence in favor of an active defense against a strong Soviet threat is the disastrous results that occur when a rigid position is used.

During the last 2 years of the war, many of the senior German commanders realized that requiring each frontline division to defend an equal amount of frontage was useless against breakthrough attacks. To remedy this situation, German commanders developed "flexible" defensive tactics. These tactics were similar to today's active defense, allowing for concentration of forces against the main attack while accepting risk elsewhere. During 1943, Field Marshal Kleist defended approximately 200 kilometers of frontage with 10 divisions. Concentrating against the main attack, he used six and one-half divisions to cover 180 kilometers and the other three and one-half divisions to cover 20 kilometers. The first echelon Soviet force attacked unsuccessfully with 20-22 divisions into the 20 kilometer sector. The second attack consisted of 30 divisions. The next three attacks consisted of about 36 divisions. The outnumbered Germans were successful in defending against all five attacks. To keep the forces in the main attack sector fresh, Kleist rotated a fresh battalion from one of the economy-of-force divisions into each of the heavily committed divisions daily. Similarly, he would rotate a fresh regimental staff every second or third day into the same divisions. By doing this, he made a conscious decision to sacrifice regimental and division integrity in order to concentrate fresh battalions at the critical points. In addition to concentrating maneuver forces, he formed a strong artillery group of 380 guns within range of the main attack. General Heinrici, who commanded the 1st Panzer Army in 1944, claimed that the proper use of these "flexible" defensive tactics required the Soviets to have a minimum ratio of 6 to 1 to conduct successful offensive operations, and that he had successfully defended against ratios as high as 18 to 1.

Even with these new tactics, the Germans had to take extraordinary measures to prevent annihilation by vastly superior Soviet forces during 1943-1945. The greatest problem in fighting outnumbered was the extremely effective artillery preparations used by the Soviets against the German frontline units. General Von Mellenthin observed such a preparation against the 19th Panzer Division. In 2 hours, the Soviets fired a 1½

days supply of ammunition from 290 guns into a 1,000 yard sector of the German defenses. After the preparation was completed, the carefully prepared and reinforced system of German bunkers resembled a plowed field. Losses to well-dug-in troops and weapon systems were high. On 14 July 1944, the Soviets began firing a preparation at 0820. By 0930, two German infantry divisions were combat ineffective. German soldiers who survived the defense of the Wotan line estimated that one Soviet shell landed every 3 feet.

To prevent annihilation of frontline troops by the artillery preparation, one Panzer Army adopted an unusual technique. The Germans determined as accurately as possible the exact time and date of the next major attack. Shortly before the initial preparation, the forward units withdrew to a second defensive line. The previously occupied positions were destroyed by Soviet artillery fire and the infantry then attacked the original positions, quickly overrunning them. When the Soviet troops began receiving murderous fire from the new defensive line, they were unable to react effectively. The unexpected turn of events had them stopped.

The Germans became quite adept at determining the time and date of an attack as a result of their intimate knowledge of the Soviet planning sequence. During the battle of Lvov, the Germans determined the exact H-hour and date of the offensive. However, they were forced to repeat the withdrawal maneuver three times during cover of darkness because the Soviets postponed their attack 2 days at the last moment. Losses were negligible. Often, the small amount of ground that was given up by this technique was quickly recovered by a counterattack. But the Russians were not without resourcefulness.

Normally, they would launch a dismounted infantry assault following the preparation, but they developed an ingenious method of attack during the last 2 years of the war to deceive the defenders. Just before the assault was to begin, artillery fire would be lifted from a few 80-100 meter lanes, along which the infantry would advance. At all other points, the preparation continued full force. It was difficult for the defenders to detect the existence of these lanes. Naturally, the Soviet infantry took some casualties from their friendly artillery, but these losses were far lighter than they would have been had the Germans detected the ruse sooner.

The German artillery proved invaluable in stopping both mounted and dismounted attacks. Soviet counterbattery fire became so deadly that extreme measures had to be taken to allow the German artillery to survive. Between five and eight alternate positions were prepared for each battery. In addition, one or two dummy positions were constructed using tree trunks to simulate guns. To keep the illusion effective, an actual gun would register from the dummy position or explosive demolitions would be set off. With experience, the Germans learned that the most effective location for the explosive charges was about 1 mile in front of the dummy position. All of the alternate battery positions were prestocked with ammunition and had wire and radio communications installed in advance.

Like today, electronic signals from an artillery battery could prove fatal. Several procedures were developed to communicate without using radio. Methods used included Morse code signal lanterns, blackboards and field glasses, mounted messengers, runners, and relayed messages. Wire communication was often totally useless after the initial artillery preparation destroyed the lines. To prevent this, wires were laid underground or through swamps.

A clever method that was used once to defeat counterbattery fires while still delivering a massed concentration against a breakthrough attack was the coordination of 80 separate batteries, each of which fired 1 round at the same target at exactly the same time. This thoroughly defeated the Soviet sound ranging methods.

Due to the nature of Soviet breakthrough tactics, each battery had to be prepared to defend itself against maneuver forces. German artillerymen were given advanced infantry training, and each battery was issued extra machineguns and grenades. Additionally, German artillery units had to be prepared to use direct fire against Soviet armored attacks.

In the antiarmor role, heavy caliber guns proved quite effective for the Germans. Even rocket launchers were used in destroying tanks when it became necessary. German commanders often considered firing battery locations as in-depth defensive positions.

A problem that is especially acute to outnumbered forces is rear area security. Russian civilians opposed the Germans with vigor. Today, the large number of Warsaw Pact unconventional forces would create a grave rear area threat to any opposing forces. According to Soviet estimates, in late 1943 there were more than 360,000 partisans operating in the Belorussian area. During the period of August through November, they destroyed 200,000 rails and wrecked or derailed 1,014 trains. During that same period, they also destroyed 72 bridges. According to the Soviets, the partisans killed 500,000 Germans, including 47 generals. Some of the operations were well

organized. On one occasion, a Soviet officer who spoke fluent German drove to a rear area command headquarters in a captured German truck, kidnapped a general, and delivered him to the partisans. The same officer also killed the deputy governor of Galacia using a similar technique.

Before the eventual rout of Army Group Center in 1944, partisans laid 5,000 mines behind German lines which hampered withdrawal. As a result of the partisan activities, rear echelon personnel clustered in the larger cities along major routes of communications. When a withdrawal became necessary, traffic became hopelessly bogged down and many vehicles were destroyed or abandoned. Von Mellenthin felt this was the most effective and least recognized consequence of partisan warfare. It seriously aggravated the problem of fighting outnumbered. To remedy it, combat service support personnel were assigned to small villages. Instead of a soft life, they now found themselves responsible for their own local security.

The United States must be prepared for similar retrograde movements under similar circumstances in a future war, especially in economy-of-force sectors. Our recent Operation Buffalo was a successful, strategic withdrawal that gave insight into some of the problems that the US might encounter when facing superior forces.

Returning to the German withdrawal, planning began well in advance. Roads and bridges were improved, assembly areas were selected and camouflaged, and extensive staff work was done to determine what could be moved and what was to be abandoned. Additionally, all telephone lines were removed and rear area command posts were set up. Extensive networks of demolitions, road blocks, and minefields were installed to inhibit the attacker's mobility. To deny the use of airfields, 1,000 pound bombs were buried in runways and prepared for command detonation. German aircraft continued to operate on these airfields until the last few hours. After detonation, the airfields were cratered like the surface of the moon.

A serious problem was the evacuation of refugees. Out of necessity a special evacuation organization was improvised. The movement of refugees was diverted from the main routes of withdrawal. Engineer detachments were sent to keep these routes open. Supply and ration centers were organized. Medical and veterinary aid posts were also set up. The biggest problem in handling refugees was traffic control, particularly close to the frontline. As much as possible, the refugees were kept dispersed and moved only at night. A noteworthy insight was that Soviet aircraft made a point of attacking refugees on a main route, realizing that the resulting panic and destruction made the road nearly impassable to military traffic. Active defense stresses the need to see the battlefield. The Germans realized this and used various techniques, including radio interception, to accomplish it. In addition to "seeing" the battlefield, the commander knew that he had to prevent the other side from getting an accurate picture of friendly dispositions and intentions.

The Germans raced westward to the Dnieper River to attempt to hold the bridges that appeared suitable for the support of massive Soviet armored thrusts. Later, the XXIV Panzer Corps crossed the Kaner bridge in 13½ hours, after which German engineers destroyed it.

Although Germany's defense was similar to our active defense, there were some differences. The idea of the strong covering force of active defense seems to contradict the German technique of withdrawing troops in contact to prevent their annihilation by artillery fire. But the idea has some logic. Even armored vehicles were vulnerable to direct hits by larger caliber rounds.

Without making any conclusions about the soundness of current US tactics, many forgotten lessons from World War II should be recovered and considered for the new "How-to-Fight" manuals, particularly where we might be facing superior forces. This could prevent our having to relearn these same lessons the hard way.

Captain Harrison graduated from West Point in 1971. He subsequently served as a Redeye platoon leader, maintenance officer, battery executive officer, and battery commander. In 1976, he completed the ADA Officer Advanced Course after which he served as an assistant S-3 and later with the U.S. Army Combined Arms Combat Development Activity, Fort Leavenworth, Kansas. He is presently assigned to the 3rd Battalion, 67th ADA (C/V) (SP), in Germany.

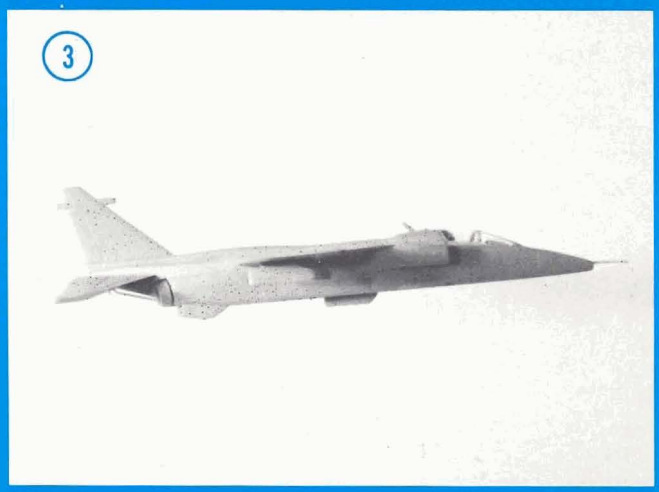
AIRCRAFT RECOGNITION QUIZ

Can you identify these aircraft?
(Answers on page 61.)

1

2

3



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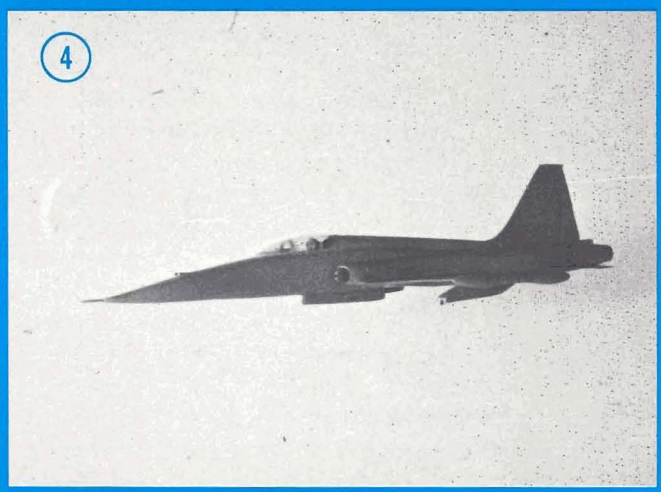

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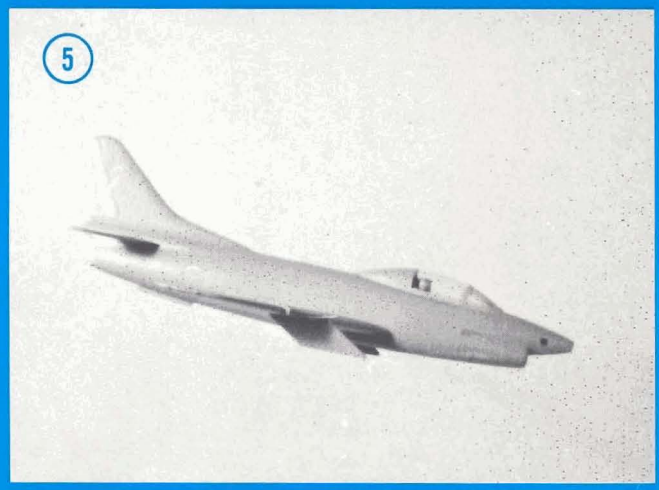
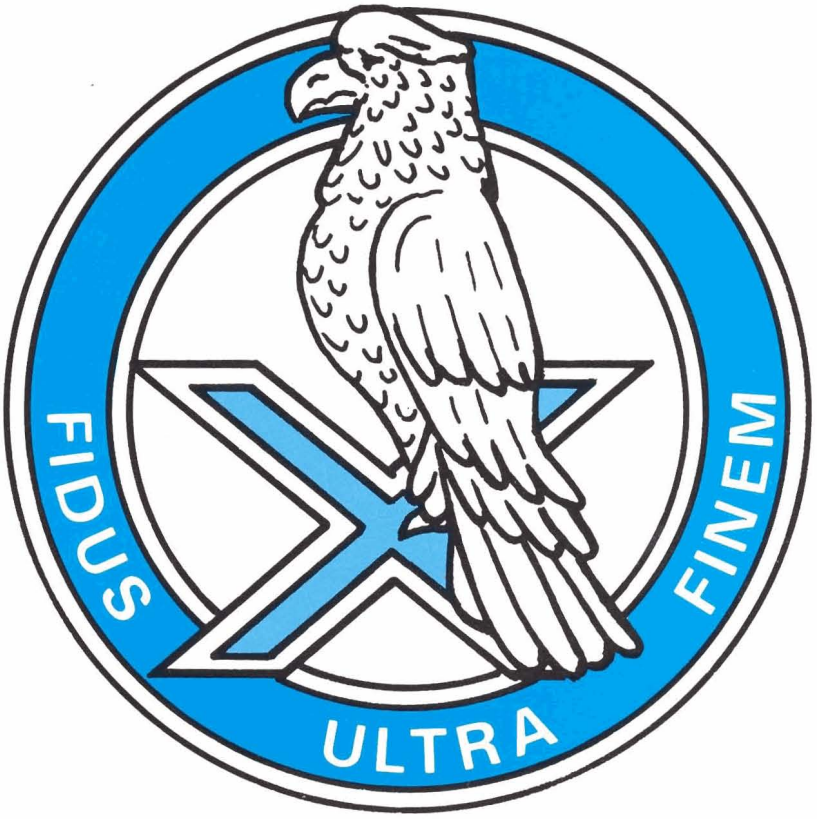


6

Lineage & Honors



AIR DEFENSE Magazine continues with the second in a series of official Lineage and Honors of Air Defense Artillery regiments. This issue features the 2d AIR DEFENSE ARTILLERY whose regimental insignia appears above.

DEPARTMENT OF THE ARMY

Lineage and Honors

2d AIR DEFENSE ARTILLERY

Constituted 1 June 1821 in the Regular Army as the 2d Regiment of Artillery and organized from existing units with Headquarters at Baltimore, Maryland

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 2d Coast Artillery, assigned to the Panama Canal Department, and activated in the Canal Zone

Inactivated 15 April 1932 in the Canal Zone

Activated 30 April 1932 at Fort Monroe, Virginia

Regiment broken up 1 October 1944 and its elements reorganized and redesignated as follows:

Headquarters and Headquarters Battery and Batteries A, B, C, G, H, and I as the 2d Coast Artillery Battalion
Batteries D, E and F as elements of the 175th Coast Artillery Battalion
Remainder of regiment disbanded

2d Coast Artillery Battalion inactivated 1 April 1945 at Fort Monroe, Virginia

Activated 1 August 1946 at Fort Winfield Scott, California

Certain former elements of the 2d Coast Artillery reconstituted and/or consolidated 28 June 1950 with the 2d Coast Artillery Battalion to form the following units:

Headquarters and Headquarters Detachment, 2d Coast Artillery Battalion consolidated with Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Group (see ANNEX 1) and consolidated unit designated as Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Group

2d AIR DEFENSE ARTILLERY

Headquarters and Headquarters Battery, 1st Battalion, 2d Coast Artillery reconstituted and redesignated as Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Battalion; concurrently Battery A, Harbor Defenses of Chesapeake Bay (formerly Battery A, 2d Coast Artillery Battalion), Batteries B and C, 2d Coast Artillery Battalion, and Battery F, Harbor Defenses of Chesapeake Bay (formerly Battery A, 175th Coast Artillery Battalion) redesignated as Batteries A, B, C, and D, 2d Antiaircraft Artillery Battalion, resepectively

Headquarters and Headquarters Battery, 2d Battalion, 2d Coast Artillery reconstituted and redesignated as Headquarters and Headquarters Battery, 12th Antiaircraft Artillery Battalion; concurrently Batteries B, C, D, and E, Harbor Defenses of Chesapeake Bay (formerly Batteries E, F, G, and H, 2d Coast Artillery) redesignated as Batteries A, B, C, and D, 12th Antiaircraft Artillery Battalion; battalion concurrently consolidated with the 136th Antiaircraft Artillery Gun Battalion (see ANNEX 2) and consolidated unit designated as the 12th Antiaircraft Artillery Battalion

Headquarters and Headquarters Battery, 3d Battalion, 2d Coast Artillery reconstituted and consolidated with Battery F, 2d Coast Artillery Battalion, Battery E, 175th Coast Artillery Battalion, and the 42d Antiaircraft Artillery Automatic Weapons Battalion (active) (see ANNEX 3); consolidated unit designated as the 42d Antiaircraft Artillery Automatic Weapons Battalion, an element of the 9th Infantry Division

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

Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Group allotted 10 June 1951 to the Regular Army and activated at Camp Edwards, Massachusetts
Reorganized and redesignated 20 March 1958 as Headquarters and Headquarters Battery, 2d Artillery Group (Air Defense)
Inactivated 15 December 1961 at Lockport Air Force Station, New York

2d Antiaircraft Artillery Battalion redesignated 27 February 1951 as the 2d Antiaircraft Artillery Automatic Weapons Battalion and assigned to the 1st Armored Division
Activated 7 March 1951 at Fort Bliss, Texas
Consolidated 20 March 1951 with the 434th Antiaircraft Artillery Automatic Weapons Battalion (see ANNEX 4) and consolidated unit designated as the 2d Antiaircraft Artillery Automatic Weapons Battalion
Redesignated 20 May 1953 as the 2d Antiaircraft Artillery Battalion
Inactivated 15 February 1957 at Fort Polk, Louisiana, and relieved from assignment to the 1st Armored Division

12th Antiaircraft Artillery Battalion redesignated 13 March 1952 as the 12th Antiaircraft Artillery Gun Battalion
Activated 8 April 1952 at Fort Hancock, New Jersey
Redesignated 15 May 1953 as the 12th Antiaircraft Artillery Battalion
Inactivated 20 December 1957 at New York, New York

2d AIR DEFENSE ARTILLERY

42d Antiaircraft Artillery Automatic Weapons Battalion redesignated 25 May 1954 as the 42d Antiaircraft Artillery Battalion
Inactivated 1 December 1957 at Fort Carson, Colorado, and relieved from assignment to the 9th Infantry Division

Headquarters and Headquarters Battery, 2d Artillery Group; 2d, 12th and 42d Antiaircraft Artillery Battalions; and the 2d Field Artillery Battalion (organized in 1907) consolidated, reorganized and redesignated 15 December 1961 as the 2d Artillery, a parent regiment under the Combat Arms Regimental System

2d Artillery (less former 2d Field Artillery Battalion) reorganized and redesignated as the 2d Air Defense Artillery, a parent regiment under the Combat Arms Regimental System (former 2d Field Artillery Battalion concurrently reorganized and redesignated as the 2d Field Artillery-hereafter separate lineage)

* * *

ANNEX 1

Constituted 5 August 1942 in the Army of the United States as Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Automatic Weapons Group

Activated 17 August 1942 at Fort Bliss, Texas

Redesignated 26 May 1943 as Headquarters and Headquarters Battery, 2d Antiaircraft Artillery Group

Inactivated 26 October 1945 at Camp Kilmer, New Jersey

ANNEX 2

Constituted 25 February 1943 in the Army of the United States as the 136th Antiaircraft Artillery Gun Battalion

Activated 15 June 1943 at Camp Edwards, Massachusetts

Inactivated 12 December 1945 at Camp Myles Standish, Massachusetts

ANNEX 3

Constituted 25 February 1943 in the Army of the United States as the 795th Coast Artillery Battalion

Activated 20 April 1943 at Camp Stewart, Georgia

Redesignated 30 April 1943 as the 795th Antiaircraft Artillery Automatic Weapons Battalion

Inactivated 31 December 1945 in Germany

Redesignated 25 June 1948 as the 42d Antiaircraft Artillery Automatic Weapons Battalion and assigned to the 9th Infantry Division

Activated 12 July 1948 at Fort Dix, New Jersey

2d AIR DEFENSE ARTILLERY

ANNEX 4

Constituted 31 January 1942 in the Army of the United States as the 434th Coast Artillery Battalion

Activated 1 March 1942 at Camp Hulen, Texas

Redesignated 5 December 1943 as the 434th Antiaircraft Artillery Automatic Weapons Battalion

Disbanded 14 January 1945 in Italy

Reconstituted 20 March 1951 in the Regular Army

* * *

CAMPAIGN PARTICIPATION CREDIT

War of 1812
Canada

Indian Wars
Seminoles

Mexican War
Palo Alto
Resaca de la Palma
Monterey
Vera Cruz
Cerro Gordo
Contrera
Churubusco
Molino del Rey
Chapultepec
Tamaulipas 1846
Puebla 1847

Civil War
Bull Run
Peninsula
Antietam
Fredericksburg
Chancellorsville
Gettysburg
Wilderness
Spotsylvania
Cold Harbor
Petersburg
Shenandoah
Appomattox
Florida 1861
Florida 1862
Virginia 1861
Virginia 1862
Virginia 1863
Virginia 1865
Maryland 1863

World War II
Tunisia
Naples-Foggia
Anzio
Rome-Arno
Normandy
Northern France
North Apennines
Rhineland
Ardennes-Alsace
Central Europe
England 1944

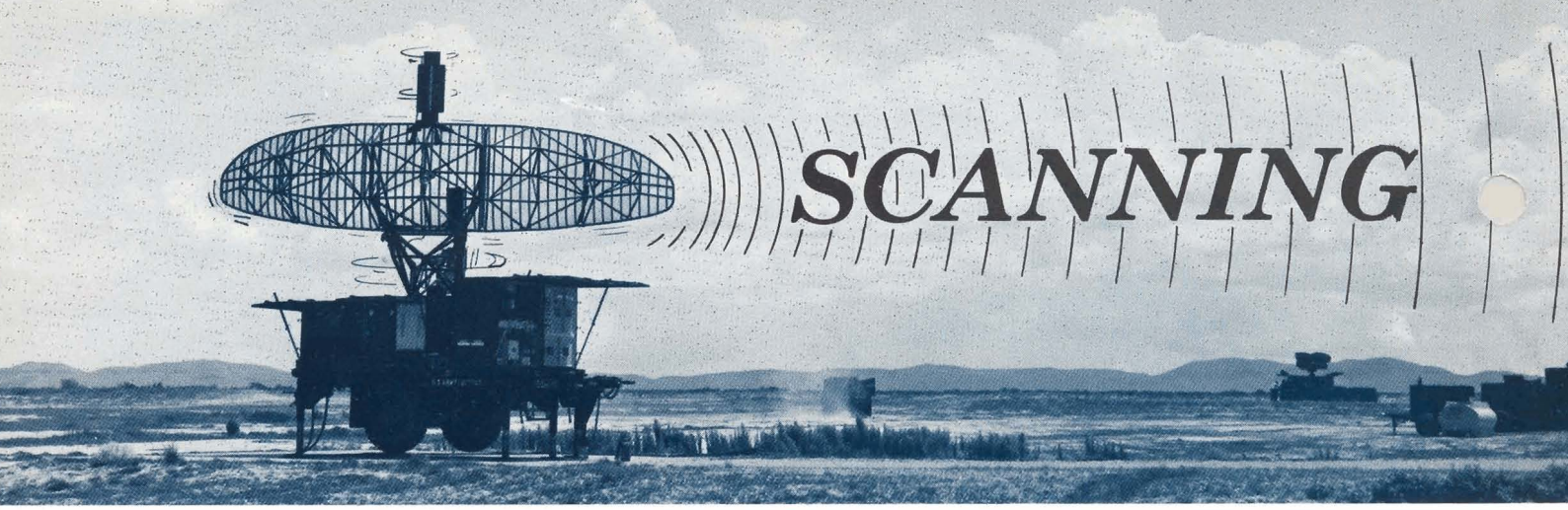
Vietnam
Counteroffensive, Phase II
Counteroffensive, Phase III
Tet counteroffensive
Counteroffensive, Phase IV
Counteroffensive, Phase V
Counteroffensive, Phase VI
Tet 69/Counteroffensive
Summer-fall 1969
Winter-spring 1970
Counteroffensive, Phase VII

DECORATIONS

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



PATRIOT

US Air Force jet fighters swarmed over White Sands Missile Range (WSMR) during tests involving Patriot, one of the Army's newest air defense systems. In what has been described as the largest operation of its kind at this National Range, up to 50 Air Force fighters were used during large scale operations 11 January through 14 January 1980. Some 280 fighter sorties were flown during the 4-day period.

According to Range officials, the test is believed to be the largest of its kind in terms of aircraft used to test Army missile systems at WSMR.

According to Major General O. D. Street, Patriot Project Manager for the Army Materiel, Development, and Readiness Command, the tests were designed to demonstrate troop proficiency in operating the Patriot system against large numbers of aircraft.

Personnel from the Army Air Defense Center, Fort Bliss, and WSMR's Army Materiel Test and Evaluation Directorate formed a test battalion to demonstrate man/machine interface in air defense operations.

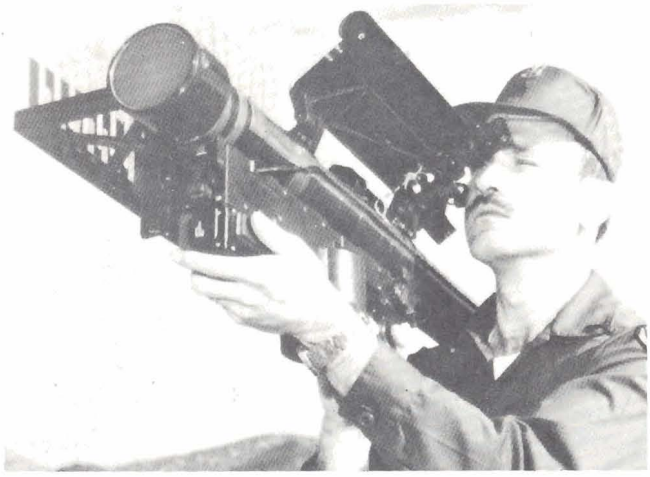
Aircraft were provided through the 12th Air Force, based at Austin, Texas. Holloman Air Force Base's 49th Tactical Fighter Wing and its 479th Tactical Training Wing provided both F-15s and T-38s. The 27th Tactical Fighter Wing (TFW), based at Cannon Air Force Base, near Clovis, New Mexico, flew F-111s, while the 388th TFW from Hill Air Force Base, Utah, and the 474th TFW, Nellis Air Force Base, Nevada, provided F-4 aircraft. The Air National Guard's 150th Tactical Fighter Group, based at Kirtland Air Force Base, New Mexico, flew A-7 aircraft during the tracking test.

Patriot, the Army's air defense system of the 1980s, has undergone extensive testing at WSMR. Preproduction operational testing has been completed and the developmental stage of testing is now under way. When fielded, Patriot will replace the Nike Hercules and Hawk air defense systems.

STINGER REPORT

The Army recently received its first Stinger air defense weapon system from General Dynamics Corporation of Pomona, California. This initial issue of the system and subsequent missile-rounds will undergo contractor tests at White Sands Missile Range, New Mexico, to insure that production hardware meets Army requirements. Following these tests, additional rounds will be fired to evaluate missile reliability.

Weighing approximately 35 pounds, the Stinger is an all-arms weapon providing immediate air defense against low-level aircraft attacking from any direction. It has improved range and maneuverability, significant countermeasures resistance, and a device that will aid in identification of aircraft.



Stinger--the shoulder-fired aircraft killer.

ENLISTED CAREER NEWS

OVERSEA EXTENSION

A proposal to require enlisted personnel in all long-tour areas (except Europe) to apply for oversea extensions up to 10 months ahead of their scheduled stateside return has been approved by Department of the Army. Also approved is a change that requires E5s through E9s in Europe to give 6 months' advance notice of their extension plans. Currently, 4 months' advance notice is required. For Japan and Panama 4 months' advance notice is required. Alaska and Hawaii extensions require 10 months' advance notice.

Soldiers in all short-tour areas except Korea will be required to request extensions 6 months before completing the prescribed tour. There is no change to the 4-month requirement for soldiers in Korea.

The new policy will give the US Army Military Personnel Center assignment managers more time to fill vacancies in stateside and oversea units. Details of this new oversea tour extension policy will be outlined in AR 614-30.

USE THAT SOLDIER'S MANUAL

Each soldier's manual (SM) is designed to tell the soldier what the US Army expects him to know and do in his military occupational specialty (MOS). It contains a wealth of information about goals the individual must achieve to be MOS qualified. Tasks, conditions under which performed, equipment available, skills and knowledge required, and standards to be met for proficiency are listed. In addition, reference publications are shown for each task. All of this information is needed by the individual desiring to reach the goals the Army has set for the soldier. While accomplishment of these goals is basically an individual responsibility, commanders and supervisors also have a vested interest and responsibility. When the individual improves, the efficiency of the unit is enhanced and, in turn, the capability of the Army to perform its mission is effectively increased.

No one is going to refer to or study an SM if it is not made available. It is absolutely essential that units maintain adequate stocks of SMs for each MOS and skill level. Units/organizations must make the SM readily available to each soldier. The more available the manual is, the better the chance it will be used. Commanders and supervisors must be familiar with the contents of the SM and use it along with the commander's manual as one of their guides in training program design. Every opportunity for permitting the individual to practice SM tasks should be exploited. During collective and individual training, reference should be made to the SM to encourage the soldier to refer to it for further study.

Getting soldiers to fully use their soldier's manual will result in improved individual performance, higher SQT scores, and improved organizational efficiency. This goal is well worth pursuing.

A few MOSs still do not have SMs published. Others have SMs in need of revision. The US Army Air Defense School's efforts to overcome these shortcomings and make the manuals as clear and helpful as possible to our ADA soldiers are continuing. As always, constructive comments, suggestions, and recommendations for improvements from the field are welcome.

CORRESPONDENCE COURSE PROGRAM

Enrollment in correspondence courses handled by the Army Institute for Professional Development (IPD) has currently reached 210,000 students. Of primary significance is that during a recent 2-month period IPD has experienced a 3,151-student increase in active Army enrollment. The correspondence course programs of 18 TRADOC and DOD schools were consolidated approximately 3 years ago under IPD at Fort Eustis. IPD believes the rise in enrollment is due directly to the increased number of promotion points awarded to active Army soldiers for completing correspondence courses. Soldiers earn one promotion point for each 5 credit hours of correspondence course work they complete. This is a very important consideration to the soldier on his way up.

Soldiers can enroll in correspondence courses by selecting a course or subcourse from DA Pam 351-20, Army Correspondence Course Catalog, and submitting DA Form 145 (Enrollment Application) to the Army Institute for Professional Development, US Army Training Support Center, Newport News, Virginia 23628.

CSM SELECTION AND ASSIGNMENT POLICY

The current policy governing selection for Command Sergeant Major (CSM) requires soldiers to decline consideration prior to the convening date of the selection board if they do not desire appointment and service as a CSM. Therefore, on this basis, soldiers who are considered and selected must accept appointment and serve as a CSM. Under this policy, if a soldier declines subsequent to selection, he must retire provided he is eligible.

Effective with the next CSM Selection Board, scheduled to meet in June 1980, this policy will be changed. Soldiers will continue to have the option of either declining consideration prior to the board or declining appointment subsequent to selection by the board. The principal change is that those who decline appointment after selection will not have to retire if eligible. They may decline appointment to CSM and continue to serve on active duty. This change reinstates the same declination policy that was in effect for boards held prior to June 1979.

In conjunction with this change in policy, soldiers who declined consideration by the June 1979 CSM Selection Board will be eligible for consideration by the June 1980 board. These soldiers will automatically be considered unless they again decline consideration under the new policy.

The current CSM assignment policy requires that TOE battalion CSM positions be filled with CSM who are qualified in the related career management field (CMF). This policy is being relaxed to allow substitution within appropriate combat arms, combat support, and combat service support categories when assignment by specific CMF is not feasible.

To support the CMF background assignment policy, the CSM Selection Boards that met in June 1978 and June 1979 operated under a two-cut concept. Initial selections were based on a best-qualified method of selection from all those considered. Soldiers considered best qualified to perform the duties of CSM were selected regardless of their CMF background. When initial selections resulted in a shortage in some career fields, board members reconsidered those records of soldiers in career fields where shortages existed. This consideration was conducted on a fully qualified method of selection. Soldiers selected the second time around were added to the selection list. In conjunction with the relaxation of the CMF background assignment policy, the two-cut selection process is being eliminated. Beginning with the June 1980 CSM Selection Board, all selections will be made on a best-qualified basis from all those being considered. The selection board will be provided with supporting guidance concerning CMF requirements.

Army Enlisted Promotion Criteria, FY 80

This table outlines in readable form the Army Enlisted Promotion Criteria for the year 1980. Save the table for ready reference.

For Promotion To	Minimum Time In Service	Minimum Time In Grade [5]	Selection Method	Selection Level	Frequency Of Selection	Level Of Qualification
Grade E2	6 mos.[1]	---	Commanding Officer	Unit	Daily/Monthly	Fully Qualified
Grade E3	12 mos.[2]	4 mos.	Commanding Officer	Unit	Daily/Monthly	Fully Qualified
Grade E4	24 mos.[3]	6 mos.	Commanding Officer	Unit	Daily/Monthly	Fully Qualified
Grade E5	36 mos.[4]	8 mos.	Semi-Centralized	Local Selection Board	Monthly	Best Qualified by MOS
Grade E6	7 yrs.[5]	10 mos.	Semi-Centralized	Local Selection Board	Monthly	Best Qualified by MOS
Grade E7	None. Considered in Determining Zone	As Announced in Zone	DA Board	Dept of Army	Annually	Best Qualified by Career Management Field
Grade E8	None. Considered in Determining Zone	As Announced in Zone	DA Board	Dept of Army	Annually	Best Qualified by Career Management Field
Grade E9	None. Considered in Determining Zone	As Announced in Zone	DA Board	Dept of Army	Annually	Best Qualified by Career Management Field

[1] Accelerated advancements permitted within percentage constraints for those with 4 but less than 6 mos. TIS.

[2] Field commanders may promote soldiers with less than 12 mos.; limited to a percentage of assigned and attached E3.

[3] Field commanders may waive to 15 mos.; limited to a percentage of assigned E3 and E4 who have at least 15 mos. but less than 24 mos. TIS.

[4] Meet eligibility criteria and attain local status based on 1,000 point standardized scoring system. Soldiers who meet the minimum time in service requirement are placed in the primary zone, and those requiring a waiver are placed in the secondary zone. Each month available promotions are determined by DA, and cutoff scores are then announced allowing that number of promotions to be made. Soldiers with the highest number of points in each MOS and zone (primary or secondary) will receive available promotions. E5 waived have at least 24 mos. but less than 36 mos. E6 waived have at least 60 mos. but less than 84 mos.

[5] May be waived by one-half.

BARS to STARS

OPMD UPDATE

OFFICER PERSONNEL SPECIALTIES

Department of the Army recently approved a major restructure of the officer personnel specialties. The restructure involves creation of a new position-only code designated 40, significant realinement of specialty codes (SC) 41 and 42, and expansion of SC 43.

SC 40 identifies senior level positions, grades 06 and 05, which are concerned with a wide range of personnel and administrative activities. It is used in multifunctional positions involving the integration and management of functions common to all three specialities. The revised SC 41 is oriented on the administrative human resources development grouping of functions and emphasizes management of personnel programs in the unit effectiveness and recruitment areas as opposed to personnel systems management. SC 42 embraces duties pertinent to management and operation of the personnel and administrative systems; i.e., functions normally associated with The Adjutant General operations. The new SC 43 focuses on the Army community. It not only retains its present club management functions, but also is expanded to include morale support, community services, and Army bands.

Effective date for implementation of the changes will be 1 September 1980. Additional information and detailed descriptions of each specialty appear in US Army Military Personnel Center (DAPC-MSP-OO) letter, 3 December 1979, subject: Letter of Notification 0-9-6, Revision of Commissioned Officer Specialty Classsification System.

OFFICER SEPARATION RULE

Officers being reassigned have 30 days after "initial alert" to notify the US Army Military Personnel Center if they plan to separate. "Initial alert" is when the officer is notified of a firm "when and where" assignment: (1) during an interview with a MILPERCEN career manager; (2) by telephone call from a MILPERCEN career manager, which is noted in the officer's career management individual file; (3) by written correspondence; or (4) by receiving a copy of a request for orders started by MILPERCEN.

Officers with 20 or more years' service planning to separate before the new assignment must submit a voluntary retirement application. Regular Army officers with less than 20 years' service must submit an unqualified resignation. Reserve officers with less than 20 years' service may submit a request for release from active duty or an unqualified resignation, whichever is appropriate.

Officers not meeting the 30-day deadline must request an exception to policy or they will be held to their orders and incur a service obligation. In order to separate, however, officers must not have a remaining service obligation as a result of, for example, a recent PCS, promotion to 05 or above or CW3 or above, or attendance at a training or educational program.

Officers and local personnel officials can verify the existence of service obligations by contacting the personnel actions section of the appropriate career management division within the Officer Personnel Management Directorate, MILPERCEN.

OPMS-USAR NOTES

US Army Reserve officers, unit or nonunit, are encouraged to speak frequently to their Personnel Management Officer (PMO) because he is the vital link for training opportunities and career management recommendations. This link is more important now than ever before. In these austere times it will be impossible for most officers (nonunit) to achieve a good retirement year through active duty training (ADT) alone. Appropriate PMOs will explain the other options for earning retirement points when you call the Air Defense Artillery Branch: toll free 1-800-325-1884, AUTOVON 693-7871. If in Missouri, call collect 314-263-7871.

Major Uhrich (Personnel Management Officer), career management code 161, is currently handling inquiries from all officers. The official mailing address for complete information is: Commander, US Army RCPAC, ATTN: AGUZ-OEC—AD, 9700 Page Boulevard, St. Louis, MO 63132.

Your Personnel Management Officer (PMO)

The principal duties and responsibilities of your PMO are provided below for your information and assistance:

- Formulates, supervises, and executes personnel plans, policies, and procedures for USAR officers not on extended active duty.
- Plans, coordinates, and completes assignments based on the requirements of the service, career needs of the individual, and the desires of the individual.
- Reviews and maintains the career management file (CMF) in a standard uniform system, and updates officer record briefs.
- Determines the desires of the officer through questionnaires, telephone conversations, and counseling sessions.
- Monitors the professional growth of each officer and makes recommendations for future professional development.
- Monitors officer selection and nonselection for promotion.
- Participates in special studies and task forces related to assignment matters.
- Manages the careers of approximately 1,200 Reserve officers (unit and nonunit).

Promotions

Officers, unit and nonunit, are identified for mandatory promotion the year prior to their promotion eligibility date (e.g., those eligible for MAJ in 1981 will be considered in May-Jun 1980). You should notify your personnel management officer at least 30 days before the board convenes if you have not received a copy of your promotion consideration folder (PCF). The additions most officers need to make to their PCF are the last two or three OERs, current letters of commendation, and an official photograph.

FY 80 ARMY PROMOTION BOARD SCHEDULE

Grade	Date	Requirement
1LT-CPT	11 Mar-18 Apr	Officers Basic Course
CPT-MAJ	6 May-6 Jun	Officers Advanced Course
MAJ-LTC	16 Sep-17 Oct	50% completion of the Command and General Staff College (C&GSC)
LTC-COL	4 Nov-5 Dec	C&GSC*

*C&GSC must be completed within 3 years after promotion to LTC.

Promotion board's considerations for all unit vacancies (all grades) are held at Army level according to the following schedule: 3-7 December 1979, 7-11 April 1980, and 4-8 August 1980.

All board results are released 60 to 90 days following board adjournment.

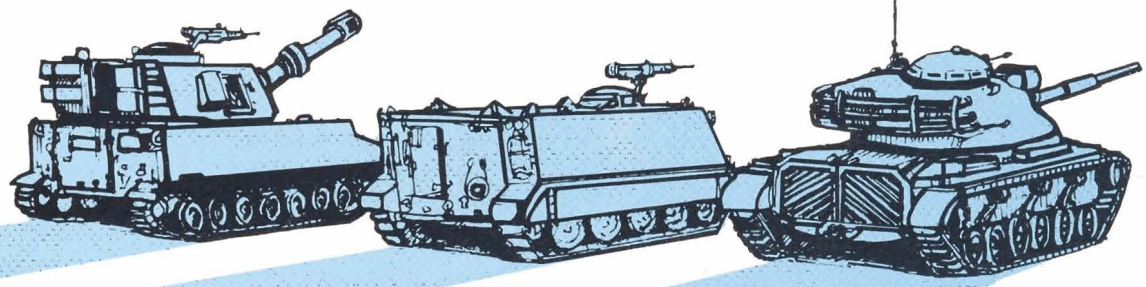
MOBILIZATION DESIGNATION ASSIGNMENTS

MOBDES annual training will receive priority consideration in FY 80 and is, therefore, the best insurance that an officer (especially field grade) will receive a tour of duty this year. Due to promotions, program expansion, and reassignments, vacancy lists are published frequently. Contact your PMO for information on vacancies.

MOS CODE 222

The Department of the Army has approved the establishment of a new Military Occupational Specialty (MOS) for Warrant Officers, for Missile System Technician, Patriot. MOS 222C (Missile System Technician, Patriot) will be published in Change 4, AR 611-112, which will be effective September 1980.

COMBINED ARMS CORNER



AIR ASSAULT SCHOOL

Necessitated by the high number of organic aircraft and increased airmobile activities, the 25th Infantry Division recently opened a new Air Assault School in Hawaii. Instruction and hands-on training at the School centers on sling-load operations.

According to MAJ E. L. Smith, Chief of the Division's G3 Training Branch, "Junior enlisted soldiers as well as officers will be trained. It is essential that soldiers involved with airmobile operations have a thorough understanding of techniques and policies and that they are confident in the equipment and in their own ability to sling-load properly."

Some 50 soldiers will be trained in each of 3 classes this year. The 5-day course is non-badge producing, but is modeled after the air assault training given at Fort Campbell.

The course includes:

- Familiarization with aircraft--4 hours.
- Basic, advanced, and helicopter rappelling--5-1/2 hours.
- Pathfinder operations--10 hours.
- Rigging and sling-loading--21-1/2 hours.

NEW ASSAULT FOOD PACKET

During February some 300 US Marines took part in cold weather training exercises to assist food technologists from the Army's Natick Research and Development Command in evaluating a new emergency assault food packet in an extreme cold weather environment. The new rations consist of various food bars including 12 different compressed, freeze-dried meat entrees, cereal bars, and a variety of confectionary bars developed for the Marine Corps. They may be eaten in a dehydrated state.

The ration items can be stored for several years without refrigeration. The packets are unique in that they can be used in extreme cold, extreme heat, or in temperate climates with no change in their nutritional characteristics since they will neither freeze nor melt. They have considerably less weight and volume per energy unit than current rations.

The caloric content per packet of the six menus that were tested averaged 1,500 calories, and the packets were issued at the rate of one per day for short assault missions.

Previous research has shown that men can function normally on 1,000 to 1,400 calories per day for short periods of time (up to 10 days) doing hard work under normal temperature conditions. The test further indicated that most estimates for caloric needs in cold climates are excessive for the properly clothed and equipped soldier.

ELECTRONIC CIRCUIT CARDS

Electronic circuit cards installed on the receiver unit of the thermal imaging system (TIS) enable crews of the US Army's new XM1 main battle tank to "see" through darkness, smoke, or haze. Recently the first production TIS was delivered to the Army. Initial Army tests of this unit were successfully conducted at White Sands Missile Range. The TIS produces an image by sensing the small differences in infrared heat radiated by objects in view and converting the detected energy into electrical signals. These signals are displayed on a cathode-ray tube. The design uses seven of the US Army's most common modules (off the shelf) which are standardized basic components or

building blocks for thermal-imaging systems. Under contract to Chrysler Corporation, builder of the XM1 tank, Hughes Aircraft Company is producing the first 110 of approximately 7,000 thermal-imaging systems.

THE XM1 "ABRAMS" TANK

The first two XM1 production model tanks rolled off the Army's Ohio Tank Plant assembly line recently. The number one tank was named the "Abrams" and christened by the widow of General Creighton W. Abrams. The XM1 Abrams is the first tank to carry the name of a distinguished American soldier since the M48 Patton. The tank is also the first totally new tank for the US Army in over 30 years. The Abrams is a much improved tank when compared with the M60-series tank. The M60-series had cast hulls and turrets while the Abrams tank hull and turret are welded from cut and shaped pieces of armor plate.

The XM1 has a lower silhouette, better crew protection, greater speed, faster acceleration, and improved first-round hit probability with its gyro-stabilized gun and fire control system. In addition to giving the tank greater power, the 1500-horsepower turbine engine is much quieter, smokeless, and lighter in weight. The turbine engine starts easily at all temperatures and is easier to maintain and repair than comparable diesel engines.

Army Chief of Staff, General E. C. Meyer, has said of the XM1 Abrams: "It will be better than anything the Russians have or that we know now that they have on the boards. It's better basically because of its survivability, its target acquisition and first-round kill capability, and because of its agility and mobility." The Army has contracted for 110 of the new tanks. Plans call for over 7,000 Abrams tanks to be built over the next 8 years.

ASALM

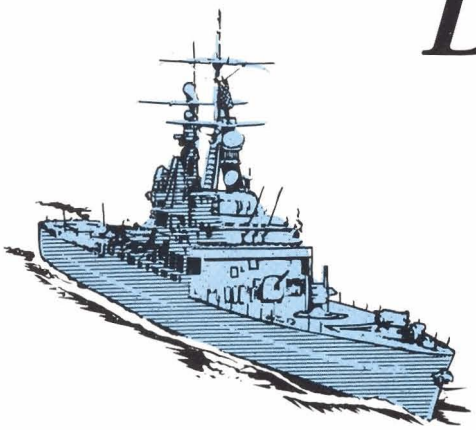
The third missile launch in a series to demonstrate propulsion technology for the Air Force advanced strategic air-launched missile (ASALM) took place successfully recently over White Sands Missile Range, New Mexico. Following launch from an A-7D aircraft, the missile flew its programed mission before impacting as scheduled on the National Range.

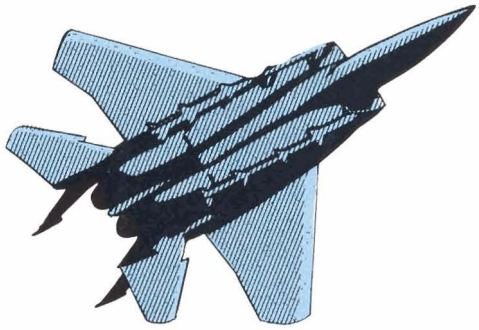
The flights aimed at validating integral rocket-ramjet engine technology for the ASALM and will continue through the spring. Previous launches took place in October and November last year.

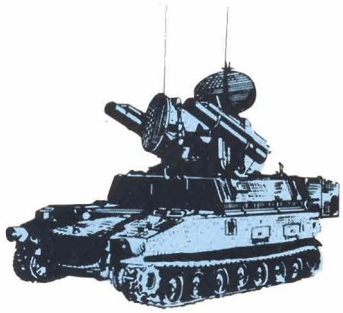
The long-range, supersonic missile is planned for eventual deployment on B-52 and FB-111 aircraft. They will be used to destroy airborne warning aircraft and hardened ground targets, and to suppress ground defenses.

The program is directed by the Air Force's Aeronautical Systems Division's Deputy for Strategic Systems at Wright-Patterson Air Force Base, Ohio.

DEVELOPMENTS







WASP MISSILE

An air-launched missile that will be able to seek out and destroy enemy armor with almost total independence from the launching aircraft is under development. The missile, called Wasp, is Army-developed for the US Air Force by the Hughes Aircraft Company.

Because of its swarm-like attacks on masses of enemy tanks, the missile would have "lock-on after launch" capabilities. This means that it is not necessary for the flight crew to see and designate a target for the missile before it is fired. After launch, Wasp initially will be programed to fly to the target area where the enemy armor has been located. A terminal guidance seeker will then take over, identifying the armor and steering the Wasp to an individual target.

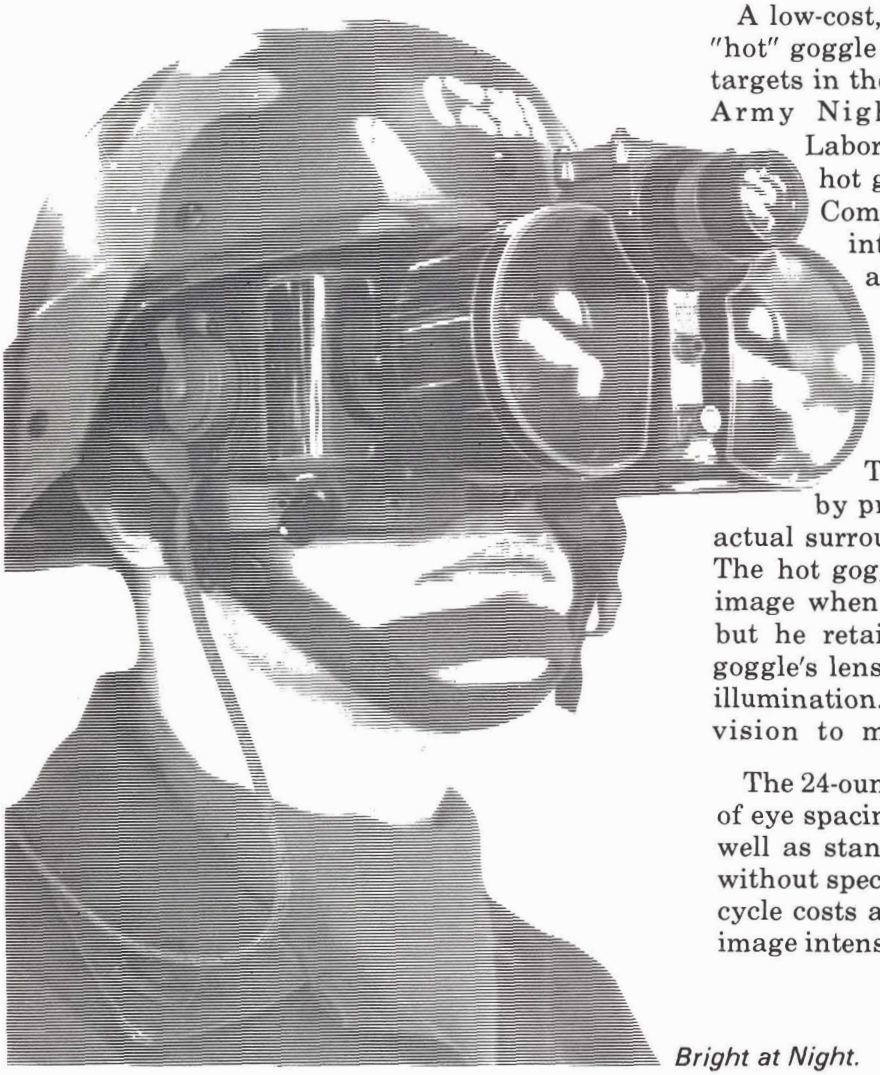
A major advantage of Wasp will be that it will greatly increase the chances of survival of the attacking aircraft as it will be able to withdraw before exposing itself to heavy enemy air defenses, explained Hughes officials. Wasp will be the first weapon ever developed that will have its own built-in ability to identify and aim itself at a target. Each missile will have to navigate and find and assign itself to a particular target. In effect, Wasp will perform most of the functions of the pilot and aircraft equipment associated with current air-to-surface missiles. Wasp will be capable of operating day or night and in inclement weather. Despite its highly sophisticated capabilities, it will be a "minimissile," approximately one-fifth the weight of the nearly 500-pound Maverick air-to-ground missile built for the Air Force.

Operational planning calls for Wasps to be fired in clusters of 10 or more. Onboard computers will direct each missile in the "swarm" to a different target as long as there are more targets than missiles. Under a $42.9-million competitive validation phase contract, Hughes will evaluate both infrared and millimeter wave radar seekers for Wasp. One of each type will undergo both tower and captive flight tests to determine which provides the most positive identification of armor targets. Sixteen prototype missiles will be built for free flight testing which will conclude the validation program. At the conclusion of the flight tests, the Air Force will choose one of the two parallel competitors to enter into a full-scale engineering development program.

MLRS FUZE

The Multiple Launch Rocket System (MLRS) time fuze was recently tested at White Sands Missile Range, New Mexico. The fuze is remotely set from the fire control panel inside the cab of the MLRS. It employs a gearless safe arm device which must have both acceleration and power to arm. The required acceleration of 130 milliseconds is achieved shortly after launch which in turn activates the timer. After 0.6 second has elapsed, enough power is generated to start the arming device. Thus, the fuze is mechanically armed approximately 1 second after launch. However, the firing capacitor is not charged until 3.4 seconds prior to the time set, producing a reliable and safe fuze.

"HOT" GOGGLES TO HELP SOLDIERS



A low-cost, lightweight, holographic, one-tube, "hot" goggle to improve a soldier's ability to see targets in the dark is being evaluated at the US Army Night Vision and Electro-Optics Laboratories, Fort Belvoir, Virginia. The hot goggle, designed by Hughes Aircraft Company, uses a third-generation image intensifier tube, supplied by the Army, and diffraction optics lenses made by a process created to produce holographic pictures. The lenses are transparent to all light except that in the special, narrow frequency projected by the intensifier tube. The tube compensates for darkness by projecting a brightened image of the actual surroundings on the inside of the lenses. The hot goggle wearer can see the intensified image when his surroundings are in darkness, but he retains the ability to see through the goggle's lenses if there is a sudden flash or other illumination. The design provides for peripheral vision to minimize possible disorientation.

The 24-ounce goggle fits any wearer, regardless of eye spacing, and accommodates eyeglasses as well as standard Army helmets and gas masks without special adjustments. Low initial and life-cycle costs are achieved with the use of a single image intensifier tube and lightweight materials.

Bright at Night.

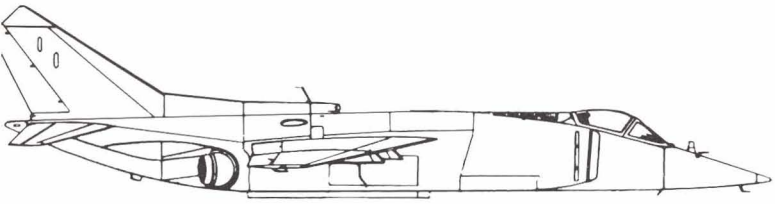
A NEW MACHINEGUN

A new, heavy, general-purpose machinegun is the first small arms weapon system to be conceived, designed, fabricated, and tested at the Army's Armament Research and Development Command since the command's establishment in 1977.

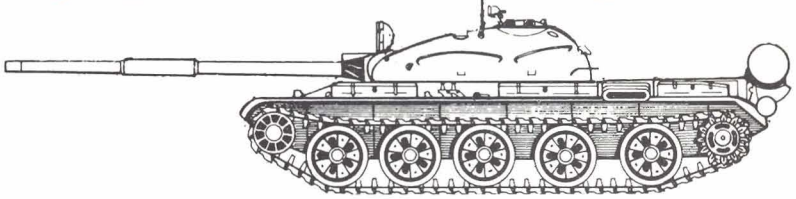
Called the Dover Devil, the machinegun is being developed to replace the present 1917-vintage Browning .50 caliber machinegun. The concept of the new weapon is unique in that it will eventually have a modular design. This will, through a quick and easy interchange of barrel, feeder, and bolt head, allow a change from .50 caliber to 20 mm.

Additionally, there is a dual-feed capability that allows the gunner to selectively fire antipersonnel rounds from one feed or antimateriel rounds from another.

The weapon is still in the initial test phase, but the goal is to develop an improved prototype weapon that can be demonstrated to all the military services.



INTELLIGENCEWATCH



AA ARMORED TRUCK

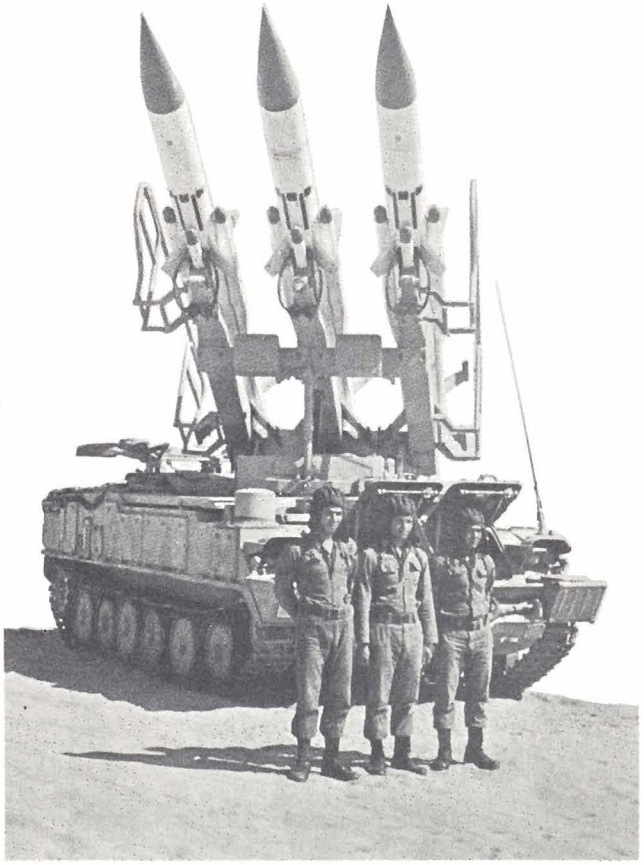
Credit, "Signal Flash," No. 18, Feb '80.

At the 1979 Military Electronics Defense Exhibition in Wiesbaden, Germany, Krauss Maffei exhibited to the public their new air defense system. This lightweight weapon is armed with twin 30-mm Mauser cannon, and is known as the antiaircraft armored truck (AAT). The system has been jointly developed by Krauss Maffei, Hollandse Signaalapparaten, and Siemens AG, using experience gained from both the Gepard and Caesar antiaircraft tanks.

Tactically, this system is ideally suited for keeping pace with and providing air cover for rapidly moving armored or mechanized military units. The system is also well-suited for the protection of key military installations and airfields in cases where lighter weight and lower costs are required. The new system carries a modern integrated search radar developed by Siemens AG. Tracking sensors and fire control units are Hollandse Signaalapparaten developments.

Prototype construction has progressed so satisfactorily that initial firing trials are planned to take place shortly. Public presentation of the new air defense system is planned for 1981.

SA-6 MISSILES IN EGYPT



Credit, "Armies & Weapons."

The Soviet Union is continuing to expand its defense industry and has become the world's second leading country as a military arms exporter. Shown below are some of the Soviet Union's SA-6 air defense missiles that were exported to Egypt in the past.

P-38 LIGHTNING AT WAR, *by Joe Christy and Jeff Ethell. Charles Scribner's Sons, New York, 1979. 144 pages, illustrated, $14.95.*

The books in the "At War" series are among the best available covering military aircraft of the Second World War. Although written by different authors, these books generally follow the same format with an excellent combination of history, personal experiences of pilots, aircraft data, tactics, and accounts of specific missions. The *P-38 Lightning at War* is no exception. Joe Christy and Jeff Ethell have used photographs, drawings, and an informative and interesting narrative to cover the "Forked-Tailed Devil" more comprehensively than any other book we have seen.

The format of the book emphasizes the development of the Lightning as well as historical accounts of its use in all the theaters of World War II. This historical coverage is highlighted with photographs of the missions and numerous accounts from the men who flew the aircraft.

An interesting chapter on the Lockheed Company, the builder of the P-38, is included, giving an idea of what the prewar aviation industry was like. This chapter has photos and information about the men who were aviation pioneers in the early days of the Lockheed Company. Their work on the P-38 aircraft is given special treatment.

Another chapter gives a comprehensive summary of the development of the P-38 design. Included are accounts of the problems encountered during the design development and the solutions that were tried to solve these problems. This chapter is particularly interesting because the P-38 was a quantum jump in aviation state of the art, and there were many problems encountered that were previously unknown.

The P-51 Mustang and P-47 Thunderbolt were used in larger numbers for a longer time than the P-38, and the Navy's F6F Hellcat and F4U Corsair were better known, but the P-38 also earned an important place in aviation history. Its distinctive twin-boom appearance made it the most easily recognizable aircraft of WW II, and Richard Bong, America's leading ace in that war, earned his victories in the P-38.

The *P-38 Lightning at War* is illustrated with more than 210 photographs and covers the entire story of the P-38 in a way that is both comprehensive and interesting.

NUMBERS, PREDICTIONS, AND WAR, *by Colonel T. N. Dupuy (US Army, Ret.). The Bobbs-Merrill Company, Inc., 1979. 244 pages, $13.95.*

Numbers, Predictions, and War is the result of a series of studies undertaken for the US Department of Defense and the British Defence Operational Analysis Establishment.

After making several exhaustive analyses, Colonel Dupuy and his associates identified the variable factors involved in combat and determined the effects of each on the outcome of the battle. Using this information, they derived theoretical criteria by which all these factors--offensive or defensive posture, logistics, weather, terrain, equipment, and relative numerical strength, to name a few--could be entered into mathematical equations to determine the probable result of any given conflict between two forces.

War gamers, political and military analysts, and anyone else interested in military history--or

in future history--will find this a truly remarkable book.

ADDITIONAL SELECTIONS: *Listed below are seven excellent books published by Charles Scribner's Sons, New York.*

AFRIKA KORPS AT WAR 1--THE ROAD TO ALEXANDRIA, *by George Forty, 160 pages, $14.95.*

In this first volume of *The Road to Alexandria,* George Forty traces the highlights of the Afrika Korps' initial momentous year in the desert. There have been many books written about the North African war, so what makes this one so different from the others? Simply that this story is told in their own words by men of the Afrika Korps. Also that most of their reminiscences and the spectacular photographs (some 260 in all) that illustrate them have never been seen by the general public before. The author's treatment is similar to that of his highly successful books on the Desert Rats, the Afrika Korps' equally famous opponents. This 9 x 12-inch book is one of the most spectacular of its type to appear in the current season.

TYPHOON AND TEMPEST AT WAR, *by Arthur Reed and Roland Beaumont, 176 pages, $14.95.*

This book tells the story of the Typhoon and Tempest series of fighter planes. Although highly instrumental in the Allied air victories during World War II, they have remained largely unsung. Arthur Reed and Roland Beaumont have set out to remedy this. They have plotted the course of the inspired Sydney Camm design, which started just before the war as the Tornado and finished after hostilities as the Fury, the fastest prop-powered fighter in the world.

The authoritative text and profusion of photographs and illustrations make this an ideal book to add to any military book collection.

PANZERS AT WAR, *by A. J. Barker, 144 pages, $14.95.*

"Klotzen, nicht Klecken"--don't tickle with the fingers, hit with the fist. This was General Guderian's unofficial motto for his Panzer Division, the deadly instrument of Hitler's blitzkrieg technique in World War II. *Panzers at War* shows what it was like to serve in a panzer division in all theaters of the war--in sun and snow, desert and steppe. It traces the development of German frontline armor from the under-gunned PzKpfw II to the fearsome Tiger--a tank that could take on a squadron of Shermans single-handedly. The book contains more than 170 illustrations, few of which have been published outside Germany.

AFRIKA KORPS AT WAR 2--THE LONG ROAD BACK, *by George Forty, 128 pages, $14.95.*

The end of 1941 saw the Deutsches Afrika Korps in Tripolitania licking its wounds and preparing for another all-out drive on Cairo and Alexandria. This second volume of *Afrika Korps at War* continues with the story from January 1942 and details the history of Rommel's efforts to destroy the Eighth Army. George Forty continues his successful treatment of the desert campaigners, adding many more unpublished photographs and personal accounts to his lively and authoritative text.

PATTON'S THIRD ARMY AT WAR, *by George Forty, 192 pages, $14.95.*

This is the story of the triumphal progress of General George S. Patton's magnificent Third Army across Nazi-occupied Europe and into Hitler's redoubt in the last year of World War II. Its actions in France, Belgium, Luxembourg, Germany, Czechoslovakia, and Austria gave a new dimension to the term "fluid warfare." The Third Army's story is one of team work--of armor, infantry, and aircraft working together with a perfection that even amazed the Germans, who had always considered themselves the masters of the blitzkrieg.

HELICOPTERS OF THE WORLD, *by Michael J. H. Taylor and John W. R. Taylor, 112 pages, $8.95.*

This addition to the well-known "of the World" series is as accurate, comprehensive, and detailed as its companion volumes. So great was the demand for *Helicopters of the World* that a second edition has been justified 2 years after publication of the original version. The text has been thoroughly revised, reflecting the ending of production of familiar types such as the Bell 47, and the introduction of advanced newcomers including the Bell 222 and the formidable Mil Mi-24 (HIND-D) gunship. Most of the illustrations in this edition are new.

MILITARY VEHICLES OF THE WORLD, *by Christopher F. Foss, 192 pages, $8.95.*

Military Vehicles of the World covers, in great detail, the majority of tracked and wheeled cargo vehicles found in frontline army service throughout the world. This second edition has been considerably revised and updated to take in all the new vehicles and new marks of the old.

With the standard "of the World" format--a photograph for each vehicle, a detailed specification where available, and a short discussion on the merits of each--*Military Vehicles of the World* is the perfect reference for enthusiast and professional.

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Contact the USAADS, Directorate of Evaluation's Hot Line for further information. AUTOVON 978-3352/3442.

ANSWERS TO AIRCRAFT ID QUIZ

Photo 1: Mi-8 Hip. This is a Soviet medium transport helicopter. An armed version of the Hip is the most heavily armed helicopter in the world. It carries even more ordnance than the Hind.

Photo 2: Alouette III. This is a French utility helicopter that can carry missile armament. It is used by many countries in a military role.

Photo 3: Jaguar. The Jaguar is a fighter-bomber used in NATO by France and Great Britain.

Photo 4: F-5 Freedom Fighter/Tiger II. The F-5 was designed and built by the United States specifically for use by other air forces. It is used in the US as an "aggressor" simulator. There are three single-seat versions (F-5A, F-5C, and F-5E) and two two-seat versions (F-5B and F-5F).

Photo 5: G91. The G91 is an Italian-built fighter. It is used as an attack and reconnaissance aircraft by Italy and West Germany.

Photo 6: AV-8 Harrier. The AV-8 is a British- and US-built attack aircraft that is also used in Spain. The Harrier is a vertical take-off and landing (VTOL) aircraft with the ability to hover like a helicopter.