AIR DEFENSE TRENDS

SEPTEMBER 1974

U.S. ARMY AIR DEFENSE SCHOOL FORT BLISS, TEXAS 79916

AIR DEFENSE TRENDS
US ARMY AIR DEFENSE SCHOOL
Fort Bliss, Texas 79916

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Turner Dedication

Mrs. Virginia Turner, widow of the first commander of White Sands Missile Range, and Major General Arthur H. Sweeney, Jr., recent commander, admire a memorial to the late Colonel Harold R. Turner of El Paso, Texas. The plaque will be bronzed and affixed at the Turner Nuclear Effects Facility. General Sweeney cited Colonel Turner for establishing the missile range, known as the "Birthplace of America's Missile and Space Activity," and for "intuitive and precise leadership" in commanding an installation for which there were no precedents. While commander of the missile range, Colonel Turner contributed significantly to advancement of the science of air defense. The nuclear facility is the most complete in the free world for duplicating nuclear environments for improved national defense, unlock - ing energy secrets, and improving the environment.

COVER. A current trend in improving Hawk system mobility is an airlift system using various helicopters. With emphasis on the air defense role shifting to direct support of forward area field forces; the need for more rapid deployment to keep pace with maneuver elements gives rise to related experimenting and testing. It appears that use of the helicopter for this purpose will become prominent.

Readers are invited to submit for publication articles and informative notes that are of professional interest to the air defense artilleryman. Articles should be current and forthrightly stated and should relate to some aspect of what air defense units in the field are doing to accomplish their mission, particularly in the technical and tactical areas. Miscellaneous articles expressing either technical or non-technical ideas that may be of value to air defense will also be considered for publication.

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AIR DEFENSE TRENDS

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Distribution of this publication 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, US Army Air Defense Command, Active Army units, major oversea commands, and military assistance advisory groups and missions.

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Small Arms in Air Defense

(Volume Fire Technique)

Lieutenant Colonel Rudy J. Wagner
US Army Air Defense School

The absence of enemy air action in the wars in which the US has been engaged during the last quarter century caused complacency regarding air defense. However, a lesson learned from the Middle East war (1973) has caused a full reawakening to the need for air defense, including the necessity for and capability of unit small arms for air defense.

In any future war, the Air Force and ground air defenders will keep many of the enemy aircraft off our backs. But a basic fact is that potential enemy air forces have more attack aircraft than we do. Their pilots are well trained and dedicated. To survive against an effective enemy air capability, every combat, combat support, and combat service support outfit must train in the use of small arms for air defense.

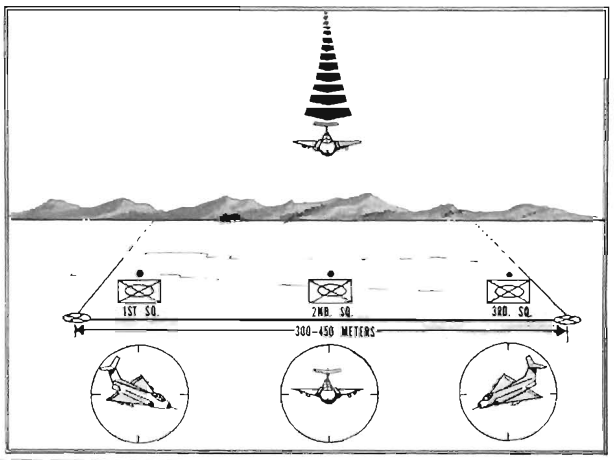
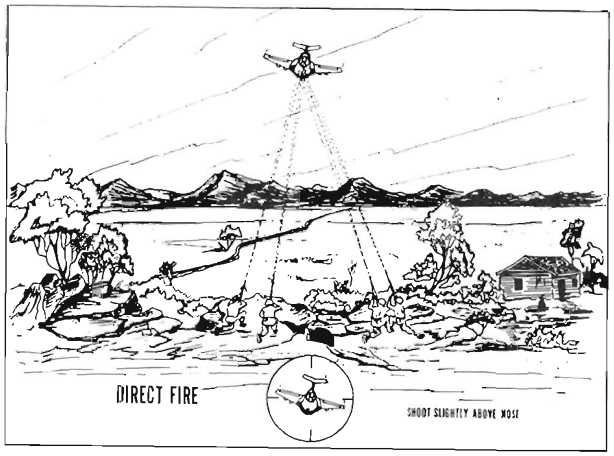


Figure 1.



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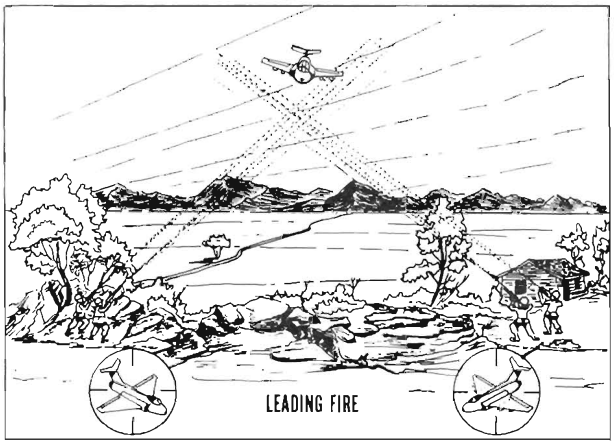


Figure 3.

Don't think that trying to knock down an attacking aircraft with small arms is useless — it isn't. In the Korean War, the US Air Force lost over 500 aircraft to small arms and air defense guns, almost 5 times as many as were lost in air-to-air combat. In South Vietnam, the US lost 410 fixed-wing aircraft and 2,100 helicopters. And over North Vietnam, small arms contributed to an even greater loss of fighter-bomber aircraft. During the 1973 Middle East war, Israeli small arms alone destroyed over 30 attacking aircraft.

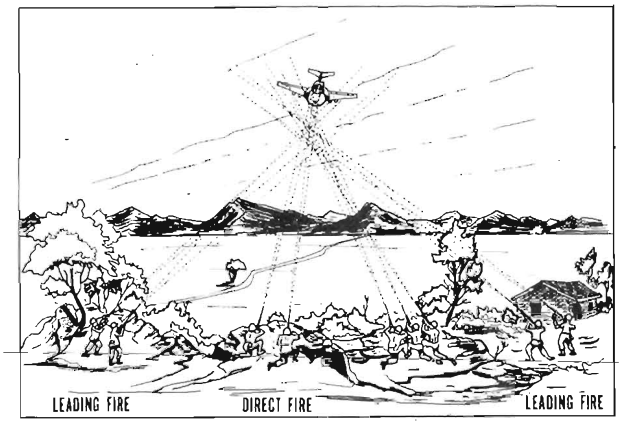


Figure 4.

What's the key to effective small arms fire against aircraft? It's simple, **volume of fire**. To get it, everybody in the unit being attacked has to shoot at the aircraft. **Accuracy** by individual M16 riflemen and M60 and .50 caliber machinegunners

is not important. Volume fire is. All right, volume is the key. But how do we get volume? What technique do we use? The best technique is the simplest one. The technique supported by the Air

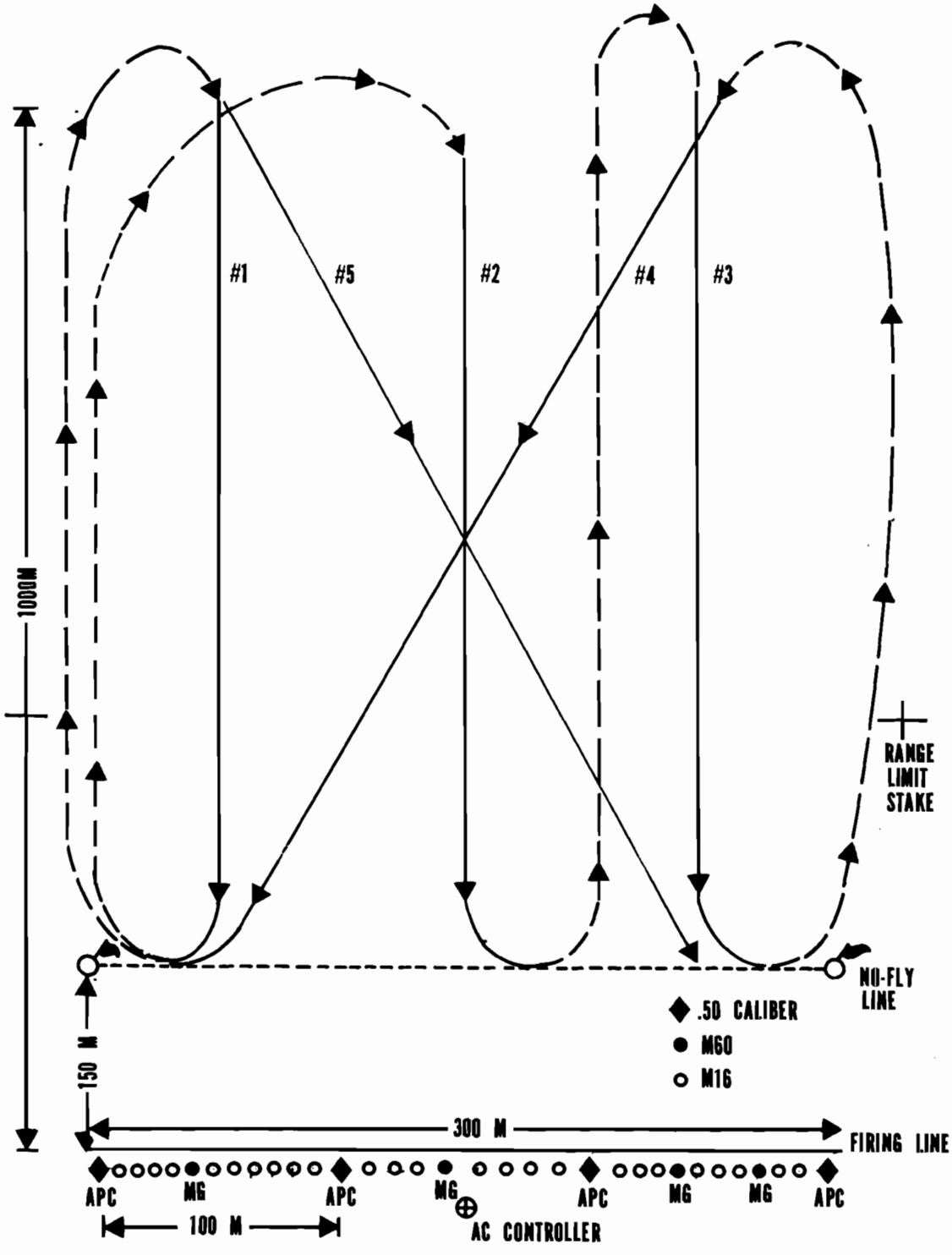


Figure 5.

Defense Center is based on one fundamental; "Get a volume of fire ahead of the aircraft and let the aircraft fly into the massed fire."

What can we learn about this technique? Let's start by looking at how individual soldiers of a rifle squad may see an attacking aircraft. Figure 1 shows a deployed infantry squad and an attacking aircraft. Second squad soldiers see the aircraft directly incoming, while the first and third squads see the same aircraft in a crossing, diving course, or a side view.

To execute the technique of placing a volume of fire ahead of an aircraft, individual soldiers and leaders must follow a few basic rules:

- Everybody must shoot.
- If you see a directly incoming view of the aircraft, fire slightly above the nose (fig. 2) and fire as fast as possible.
- If you see a crossing, diving view of the aircraft, you must pick a point in front of the aircraft, take a lead, and fire as fast as possible (fig. 3).

Figure 6.

Figure 4 shows the total result — volume fire ahead of the aircraft. This technique is not new. Our field manuals and training circulars make reference to using barrage or a curtain of fire technique. What is new is: first, an all-arms emphasis on using small arms against high-performance aircraft; second, simplicity of the volume fire technique; third, the use of a "football field" lead to get the proper distance ahead of the attacking aircraft.

One of the rules is, if you see a crossing, diving view, **take a lead.** But how much lead? How far in front of the aircraft? Remember, he's zooming in at around 450 knots. Soldiers won't have time to calculate how much lead to take, or time to adjust with tracer fire. Let's keep it simple. Let's teach him that when he sees the crossing, diving view he leads fast targets (jets) by the length of one football field, slow targets (helicopters, fixed-wing, observation type aircraft) by one-half football field. The object is not to teach the soldier to swing his weapon to a specific number of degrees or mils lead, the object is to use the football field analogy as a mental triggering device so that he automatically points his weapon ahead of the aircraft. With everybody shooting, some directly at the target and others taking their mental image of a football field lead, a volume of fire covering a large area is obtained. If the aircraft continues on its course, it runs into this massed fire. (fig. 4).

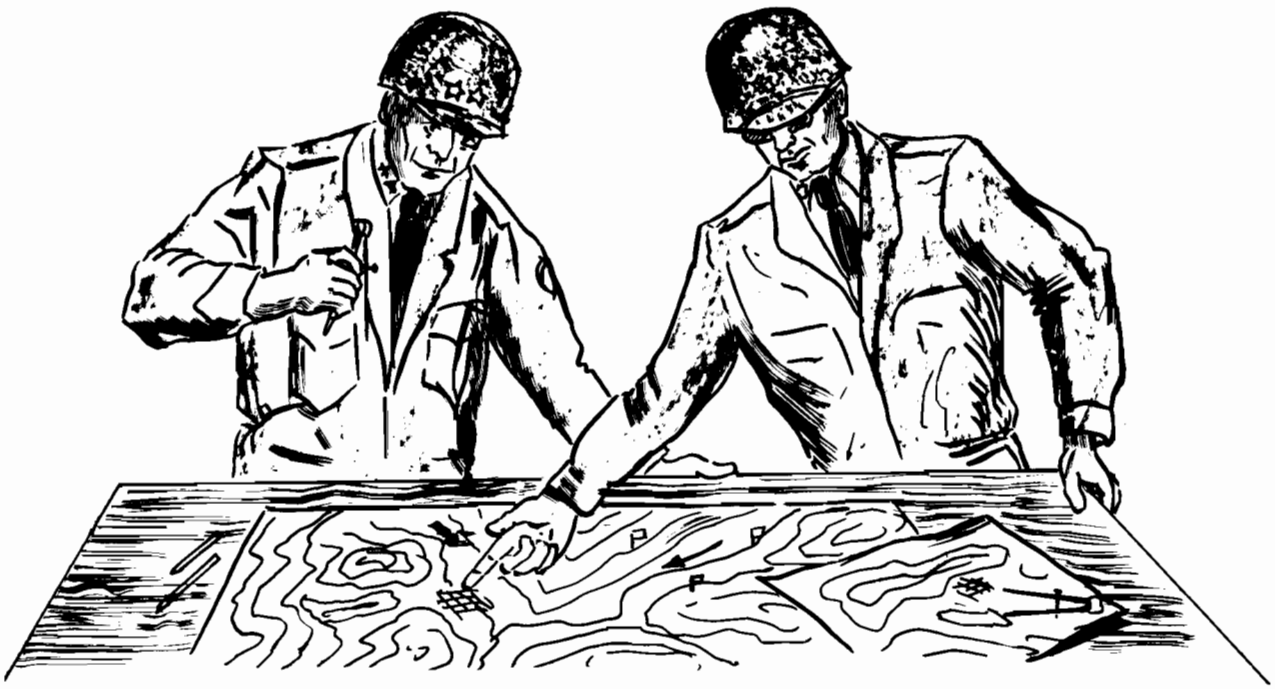
Figure 7.

Recently, the men of the 1st Battalion, 58th Infantry (Mech), 197th Infantry Brigade (Separate), used this technique during a training visit to Fort Bliss. Each company fired by platoons against radio-controlled model aircraft (size was less than 1 square meter), using platoon organic weapons (M16, M60, and APC-mounted .50 caliber). Target aircraft were flown directly at a specific platoon element, presenting some troops with a directly incoming course while others saw the crossing, diving course (fig. 5).

Several aircraft were flown at various altitudes (50-1,000 feet) and speeds (50-120 mph). The results were excellent. All target aircraft received multiple hits from all types of weapons used. (fig. 6). On three occasions, the marksmen completely destroyed the target (fig. 6), watching it crash in the desert. When the aircraft was recovered by the controller, it had multiple holes in fuselage, wings, and tail (fig. 7). The training was well received by the troops, an important aspect being the development of confidence that men can protect themselves against low-flying, attack aircraft.

Once again we find ourselves at the stage in training when every soldier, regardless of branch, must be thinking of how he can help keep attacking enemy aircraft off himself and his buddies.

Division Control of Organic Air Defense



After more than a decade of being without organic AD, the division can once again plan its maneuver with an assurance that some of its more critical assets will again have AD protection, thanks to its organic C/V battalion. But how is the battalion used? Is it being properly controlled and employed? With the long absence of ADA forces from the division, many of the WWII and Korean war combat lessons learned concerning control of ADA forces have been forgotten. A glaring example is that divisional C/V battalions have been assigned to division arty and even to a brigade. This is done to facilitate administration and control in a peacetime environment. This situation will not exist in a combat environment. A maxim has been established in the military history of all nations — men do in battle what they are trained to do in practice and peacetime and that includes administration, command, and control. Therefore, it seems prudent that we should examine one of the more critical issues of ADA rejoining the division — CONTROL OF THE ORGANIC ADA BATTALION.

How can the division commander best control his ADA battalion? An easy answer is to state, "established ADA doctrine is explicit in placing the ADA battalion under division commander control and the ADA battalion commander is a special staff officer on the staff." — But this is simply saying do it! A more important question is, why does ADA doctrine dictate that?

Let's begin by examining the role of the C/V battalion and its commander and, perhaps, the reason for our explicit doctrine will become clear. The C/V commander manages the CG's ADA assets. His C/V battalion provides the division its

basic AD protection. He and the Hawk battalion commander (ADA doctrine places a Hawk bn in DS of a committed division) conduct joint planning to insure AD coverage is maximized over the division zone. The commander has specific training, tactical advice, and staff supervision responsibilities concerning Redeye and the use of organic small arms in an AD role. In short, he plans and recommends the use of ADA to the CG. Once his recommendations are approved, he employs organic, attached, and supporting ADA. To do his job properly, the C/V commander has to be close to where the tactical decisions are made. He must take the commanders' scheme of maneuver and develop the AD plan to protect divisional, combat, combat support, and combat service support assets that are vital to mission accomplishment. Once the scheme is put into operation, he must react to air threat contingencies that may affect the scheme of maneuver. If he's removed from direct command control, it is doubtful that he can adequately perform his responsibilities.

As with any working arrangement, there are advantages and disadvantages. Here are a few that standout.

C/V Under Division

Advantages:

- Allows the C/V commander to better employ organic attached and supporting ADA to support the division's scheme of maneuver.
- Allows the C/V commander to execute his responsibilities as the ADA special staff officer.
- Eliminates command layering.
- Early warning and changes in ADA weapons control status information get to Chaparral, Vulcan fire units, and Redeye teams faster.
- Facilitates AD coordination and planning for use of: divisional assets (Redeye, Small Arms for AD); nondivisional assets (DS Hawk); other ADA units adjacent to the division.
- Facilitates AD coordination and planning among the corps and the region/theater AD commanders.
- Reduces the chance of mismanagement of AD assets.

Disadvantage:

- Increases the division commander's span of control.

C/V Under DIVARTY/Bde

Advantage:

- Decreases the division commander's span of control.

Disadvantages:

- Requires the division commander/staff to go through the DIVARTY/bde commander for AD support.
- Denies the division commander/staff an AD special staff officer.
- Requires the C/V commander to go through the DIVARTY/bde commander for decisions on priorities for ADA employment.
- Increases command layering.
- Restricts AD coordination and planning.
- The DIVARTY/bde is not staffed to assume AD planning and coordination responsibilities.

To get the most out of the division's ADA, the C/V commander must be under the control of the CG. Any other arrangement dilutes both ADA and ground force success in battle.

Viewpoint From the Field

In keeping with the role of providing a sounding board for the views or our personnel serving in field units, Air Defense Trends recently received a letter from CSM Burnance L. Haddock, CSM of the 6th Battalion, 56th Air Defense Artillery, stationed at Spaugdahlen Air Force Base, Germany. His letter contained his personal views in becoming a better supervisor which were prompted by his reading the Ten Rules in Commanding a Battery, published in our September 1973 issue. Air Defense Trends wishes to share them with you, its readers, since they represent the personal views of one of our more experienced NCO's serving where the action is — an ADA unit in the field.

- Be tough. Have the courage to correct, reprimand, or relieve a subordinate if he fails to follow a strict policy of high standards.
- Get out from behind your desk and see what's going on. Know your organization and people and leave your footprints throughout the unit. Let your people know you are interested in them and their problems, their working conditions, and their welfare.
- Search out your problems. Don't inhibit your people by making them think you don't like problems, don't expect problems, and anyone who brings them to you is in trouble.
- Determine your unit's make-or-break activities. Find out what the critical path is, then let your weight be felt in this area.
- Develop sensitivity. Improve your ability to perceive the real problems and sort them out according to realistic priorities.

• Don't take things for granted. Don't assume that something has been fixed; take a look for yourself and get the facts. Be from Missouri - make 'em show you once in a while.

• Don't tolerate incompetence. When someone demonstrates that he's either too lazy or too disinterested, unwilling, or unable because of aptitude to get the job done, then you owe it to the Army to call his hand.

• Don't alibi. Just fix it. Not everything can be perfect and everybody, including yourself, will make mistakes. The point is to recognize them and take action to avoid any recurrence.

• Don't procrastinate. Don't put off those tough decisions just because you are not willing to make them today.

• Be honest. Don't quibble, but tell it like it is, and insist that your people level with you in everything they say and do in connection with their duties.

The Demise of AD and the Rebirth of AAA

Major Andrew E. Andrews
Headquarters, 6th Battalion, 56th Artillery

The views presented by the author are generally in consonance with the doctrine currently being taught at the US Army Defense School. Certainly, air defense tactics are dynamic and there is a need for more air defense units in our force structure. While the US Army Air Defense School recognizes this need, the ratio of one air defense battalion to a committed brigade is probably too high. Further, the positioning of Hawk well forward and Nike Hercules as far forward as possible, consistent with survivability, is sound. However, introduction of Nike Hercules into the division area cannot be supported.

Speculation about the future of Air Defense Artillery (ADA) is heard in any gathering where members of the Branch are found. The same conversations contain comments espousing the need for a cohesive and definitive employment doctrine. And at this point, the conversations unabashedly delve into the realm of tactics founded on the capabilities and peculiarities of specific weapon systems. Somewhere between air defense (AD) returning to the division, Hawk in direct support of the division, and where Chaparral can best be employed, the subject of doctrine is subdued.

Perhaps the reason the AD doctrine receives so little attention is the transient state of Army doctrine as a whole. In the school year 1972-73, the Command and General Staff College (C&GSC) taught the concept of Theater Army Support Command (TASCOM). At the time of this writing, TASCOM in Europe is being abolished. Concurrent with the life cycle management model being taught at C&GSC, the main battle tank 70 and Cheyenne were being scrapped. The demise of the projects could be attributed to insufficient cost benefit. This being true, it is valid to assert that the life cycle management model has deficiencies because the investment prior to cancellation should have been less. Hence, the model becomes subject to review and change. These gross examples are not meant to be definitive; rather, they illustrate that the thesis of Alvin Toffler's **Future Shock,** transience,[1] is upon the profession of arms.

If the profession is faced with transience, doctrine, of necessity, must be transient and tactics more so. It is no longer sufficient or even necessary for doctrine to be keyed to specific weapon systems and capabilities. It is, in fact, an impossibility from the economic standpoint. If this premise is accepted, a concise and comprehensive doctrine for air defense can be established through logical development.

The Historical Present

At the close of World War II, antiaircraft artillery had emerged from coast artillery with short-range gun systems. This development resulted from the airplane being established as a weapon of importance. The third dimension of warfare had emerged. Concurrently, the nuclear weapon appeared and shorty thereafter was in the hands of a potential enemy. To combat the potential of the nuclear armed aircraft, the Nike Ajax was fielded. Then, with the close of the Korean conflict, the gun-type systems of antiaircraft artillery (AAA) disappeared. The specialization of air defense was born.

The specialization continued in an atmosphere of technological development through the fielding of Nike Hercules and Hawk. But shortly after the inauguration of President Kennedy, the missile crisis broke. Nike Hercules and Hawk became obsolete as a deterrent in the face of the ICBM.

Nevertheless, air defense proceeded into the future with hopes for Nike Zeus and continued prosperity for air defense organizations.

Next came the Kennedy-McNamara concept of measured response. With this concept, there was an apparent realization that the "divisional forces" need **some** air defense. Hence, Redeye came along in the **new** tradition of air defense - rely on missile systems. And then came the war in Vietnam.

With this war came the recall for the Duster and quad-fifty. Subsequently, the Chaparral and Vulcan systems made their appearance and it became clear that air defense was needed in the division. Air defense had to change in concept and doctrine if it was to remain a viable and necessary combat arm.

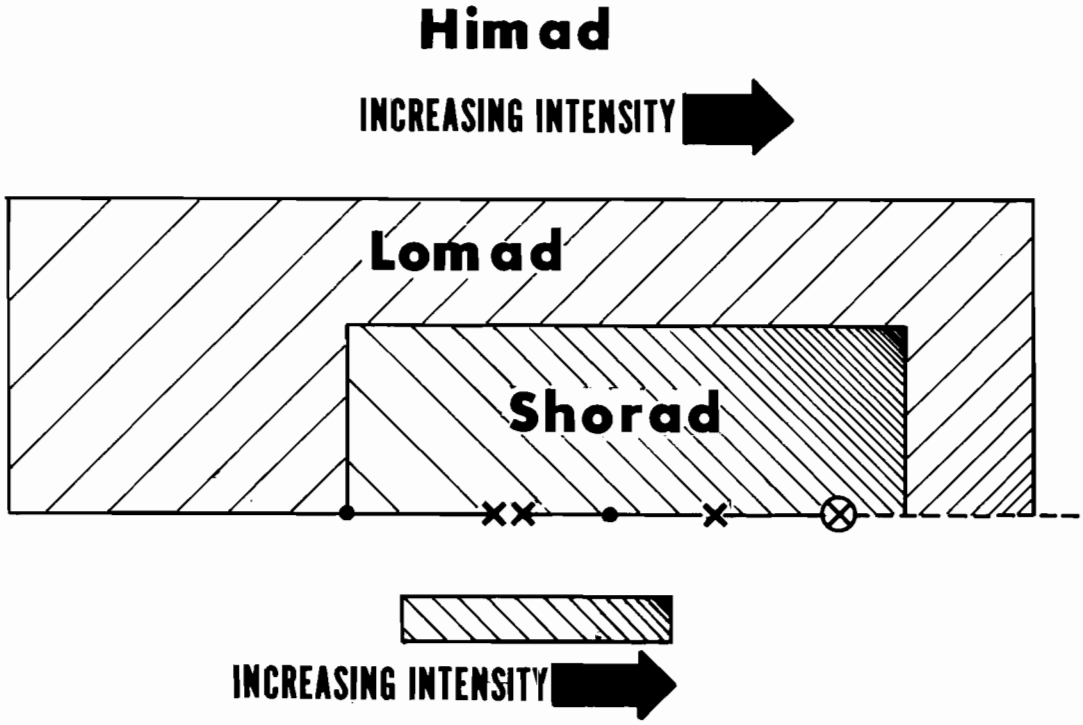
This year has brought about the shut down of ARADCOM. This closure indicates that all air defense organizations and organizational doctrines are subject to scrutiny during the next few years. And if the same examining criteria are used, radical organizational and tactical changes could become imperative within the Branch.

The Necessary Direction

The term air defense is perhaps the root of the problem. During the period following the Korean conflicts the emphasis was placed on denying the enemy the delivery of ordnance on a traget. Denial of penetration became axiomatic. As long as the enemy did not fly against us, he could retain his aircraft. This position has become deeply ingrained during the 20 years. The concept, however, is not valid. Modern technology has made it possible for a determined enemy to penetrate any defensive system. Assessing the exact cost to the enemy for penetration is a moot point in the context of denial of penetration. If we face an enemy in a major war, he **will** pay the price or probably suffer defeat in the face of our air power.

As has been stated, the third dimension of war came of age with World War II. Today, surface-to-surface and air-to-surface fires are used both offensively and defensively. In contrast, surface-to-air fires are used only defensively. Yet the tactical forces of the Army, the divisions and brigades, take the battle to the enemy. For Army air defense to be compatible, it should emulate the division and carry the battle to the enemy. Air defense should become artillery and assume its rightful place in integrated fire support.

Expanding on this premise, the chart below graphically portrays this concept for the classical alinement of opposing forces. Based on the capabilities of Nike Hercules, Hawk, Chaparral/Vulcan, Redeye, and weapons of the individual soldier, the requirements of this concept can be



CROSS SECTION OF ANTIAIRCRAFT ARTILLERY COVERAGE

met today, albeit some improvement is warranted.

Lumping Chaparral/Vulcan, Redeye, and individual weapons together as short-range air defense (SHORAD), these fires become synonymous with final protective fires. Because of their shorter range, systems such as these take on the characteristics of close combat. These are the bayonets of air defense.

Reaching out further, the low-altitude missile air defense (LOMAD) and high-altitude missile air defense (HIMAD) systems should strike at the air lines of communication of the enemy, as well as complement and reinforce the SHORAD fires. Additionally, the fires should engage enemy attack aircraft before they enter the forward battle area. This requires Hawk and Nike Hercules to move into the division's forward area.

Total Integration

Questions regarding the pursuit of an offensively oriented antiaircraft artillery are plentiful. The majority of such questions can be classified as tactical; that is, addressing implementation of doctrine. There are points that directly affect consideration of doctrine because they concern its plausibility. Examination of these points further leads to a major conclusion about achievement of an offensively oriented AAA.

Consider SHORAD assets. Regarding only Chaparral/Vulcan and Redeye, many cost benefit studies can be envisioned to determine weapon system density in the division. Ultimately, a decision can be reached. The validity of the decision, however, cannot be determined short of war. While this author favors placing a C/V battalion in direct support of each committed brigade, based on evidence from the Mideast, such judgements are only answers to highly transient questions. Hence, the logical answer to how much antiaircraft artillery to buy is to buy what one can afford. A better question is, how can SHORAD fires be maximized? The answer lies in the soldiers of other arms.

From the Branch standpoint, it is desirable to retain with air defense the AD function within the brigade or division. Experience with Redeye can be used to support this position. Its weakness comes in the past reliance on relatively complex systems (such as Redeye) for fighting the air war. Consider, instead, mounting a minigun on one track in each mechanized infantry platoon and **really** training soldiers to engage aircraft with individual weapons.

In the area of SHORAD fire, coordination and integration are not significant problems because engagements are based on visual recognition and the right of self-defense. Turning to HIMAD and LOMAD fires, the need for integration and coordination of fires becomes a necessary, but solvable, problem. During the Vietnam War, fires from field artillery and naval gun systems were effectively integrated with air strikes. Additionally, air space was effectively coordinated among the requirements for Army and Navy surface-to-surface fires and air traffic of all services. The integration and coordination could be expanded to incorporate antiair fires.

With this step, the branch could become part of the division and could carry the battle to the enemy. But one more prerequisite remains.

In considering SHORAD fires it was stated that soldiers should **really** be trained to engage aircraft with individual weapons. In essence, this suggestion implies that all soldiers must consider the third dimension of war and look up. Also, the need for integration of HIMAD and LOMAD fires has been stressed. These points lead to the conclusion that total integration will be possible only when air defense looks forward and integrates its firepower into **all** supporting fires. SHORAD systems should not be held in reserve for an eventual antiair battle. SHORAD is artillery!

A New Doctrine

The preceding discussion does not negate doctrinal concepts of mutual support, balance, and so forth. Nor does it negate the definitions of the types of defenses. Instead, it augments these concepts with proposed, new doctrinal attitudes for the future by suggesting a necessity for offensive action. Specifically, it is suggested that:

I. SHORAD fires be increased perhaps through an antiair battalion being placed in support of every committed brigade to augment the brigade's organic firepower.

II. Antiair fires be integrated into, and coordinated with, all other artillery and air fires within the division or echelon above division as appropriate.

III. HIMAD and LOMAD systems be moved forward in the division area to **attack** the enemy forward of the forward edge of the battle area.

IV. Antiaircraft artillery not be held in reserve for the air battle.

Conclusion

This article has avoided addressing questions such as, "Should Hawk be in direct support of the division?" This was done because such questions fall in the area of high transience. They are tactical, not doctrinal, considerations. Such questions should be addressed in the immediate future, but the answers can come only after resolution of a coherent doctrine.

The doctrinal suggestions made above encompass a significant change in direction from the past

20 years. Our prime concern is no longer strategic defense but tactical offense and defense. The time may be upon us to look back at our heritage and again become Antiaircraft Artillery.

Major Andrews, currently S3, 6th Battalion, 56th ADA completed the Master of Military Arts and Sciences program at the C&GSC and holds a Master of Science degree from the University of California. He has previously served at USAADS, the Defense Nuclear Agency, and in Vietnam.

[1]Toffler, Alvin, **Future Shock** (New York: Bantam Books, Inc., 1972). The thesis of Dr. Toffler's text is that all society is undergoing change at an accelerating pace. The rapidly increasing pool of knowledge in turn creates rapid changes in organizational structure, life styles, etc. The significance is that the **rate** of change is increasing quickly and organizational concepts, machines, technology, and current concepts or doctrine are transient in nature. The implication is that for an organization to survive, it must become internally transient in order to keep pace with the external environment.

From the Branch Chief Officer Personnel Directorate

Colonel Archie S. Cannon, Jr.
Chief, Air Defense Artillery Branch
Officer Personnel Directorate

Order of Merit Lists (Development and Use)

This article, furnished by the Air Defense Artillery Branch, provides information pertaining to the development and use of Order of Merit Lists (OML). Included are facts that explain the evolutionary development of the OML system, the need for OML's, and the manner in which they are developed and used. The article was written for general dissemination by the US Army Military Personnel Center's Officer Personnel Directorate.

Note: Since this article was submitted for publication, there has been a Department of Army policy change regarding the formulation and use of OML's. In July 1974, it was decided that Branch OML's would no longer be submitted to future DA Promotion Boards. The Order of Merit List will be used as a part of the senior service college selection system for FY 76, but will not be used afterwards. OML's will continue to be used for CGSC selection. As this article is read, please keep these changes in mind. The article still provides a very good perspective on the formulation and use of OML's – present and future.

OML Development . . . Past and Present

OML's have been developed by the career branches of the US Army Military Personnel Center's Officer Personnel Directorate (OPD) since the branches received a mission involving the selection, nomination, and assignment of officers. Prior to 1968, each of the career branches had its own system for preparing OML's. In 1969, the career branches were assigned to one of three committees, based on similar functions and type missions. Each committee developed a standard OML system for use by all branches belonging to that committee. Thus, instead of 15 systems used in 1968 and earlier, 3 systems were used in OPD in 1969.

A long-range goal in OPD's efforts to refine OML scoring procedures was the development of a single system that would standardize the scoring of factors common to all branches, while accommodating the uniqueness of each branch.

In 1970, OPD established a single, standardized

system for use by all branches. Since then, OML development procedures have been reviewed on an annual basis. These reviews assure that OML procedures and criteria are revised to remain attuned to existing Army policy and requirements. The latest review was completed on 15 January 1974.

OML Preparation

The career branches prepare OML's for their own use and for consideration by specific Department of the Army selection boards. OML's prepared by the career branches list, in relative order of merit, those officers eligible for consideration for a particular selection action.

OML production is event oriented. It is significant that no standing "branch OML" is maintained on a continuing basis. An OML evaluation of an officer may be considered as a "snapshot" taken at a point in time when the officer is eligible for school attendance or promotion.

The OML development process allows an evaluation of the significant indicators of officer performance and potential value to the service. A combination of objective and subjective evaluation methods is employed. The objective method allows standardization of the process, while the subjective method allows the career branches to exercise judgment to ameliorate the inequities that any objective formula will create.

An officer's position on an OML is based on a comprehensive evaluation of his overall record in comparison with other eligible career branch contemporaries. The individual's Officer Record Brief, evaluation reports, and other documents in his file are reviewed and analyzed by experienced officers of his own branch, following standardized procedures and criteria.

During OML development, the significant indicators of an officer's merit and overall potential are considered. These are manner of performance and potential, as derived from evaluation reports, military and civilian education levels, and combat experience. The evaluation of manner of performance and potential accounts for over two-thirds of the total OML development, while weights assigned to the other criteria are subject to change from year to year.

OML Use

The need for OML's stems from OPD's responsibilities for selecting officers for Command and General Staff College (C&GSC) and equivalent level school attendance, providing OML's to certain Department of the Army (DA) selection boards, and for other personnel actions. The procedure for C&GSC and equivalent school attendance prescribes that each career branch select from a branch OML 90 percent of its branch quota. The remaining 10 percent of the total Army C&GSC quota is selected by a DA board, without regard to branch, from the list of nominees provided by the career branches. OML's provided to DA selection boards (Senior Service College (SSC), LTC and COL, AUS) are for board review and use as appropriate. Final selections for promotion and SSC are board decisions and are not based on branch OML standings.

In selection, each career branch participates by nominating a proportionate share of its officers for selection board consideration. The sum of individual branch nominees equals two and one-half the number of student spaces available to the Army. As a basis for these nominees, each branch develops a SSC OML. Concurrently, a DA screening board nominates a like number from the total eligibles, but without regard to career branch quotas or affiliations. A combined alphabetical list (career branch nominees and screening board nominees) is submitted to the DA Selection Board. Additionally, the Selection Board is provided an alphatical list by branch of the nominated officers whose branch OML standing places them in the top 15 percent of their respective branches. While these lists must be reviewed by the board, the extent of actual use is a prerogative of the selection board.

In the case of colonel and lieutenant colonel (AUS) promotion boards, each career branch furnishes an OML of all branch officers in the primary zone of consideration. These OML's are developed only for submission to the particular boards. As with senior service college selection boards, the OML's must be reviewed by the promotion boards, with board prerogatives dictating the extent of actual use.

As mentioned previously, officers are OML evaluated only for specific purposes as they are eligible. For example, a major who is a graduate of C&GSC and is on a recommended list for lieutenant colonel will not be OML evaluated until he is eligible for SSC or in the zone of consideration for promotion to colonel. On the same basis, it is possible for an officer to be OML evaluated several times during the same year. For example, some officers may be eligible concurrently for consideration for selection for senior service college attendance and promotion.

An OML standing is valid only for the particular purpose for which the OML was developed, and then only temporarily. An officer's relative standing on OMLs will probably change from list to list as the manner of performance of each officer in the particular group changes. Positions of officers also change from list to list as deaths, resignations, retirements, and similar factors affect the group.

In addition to the primary use of OML's as aids in selecting officers for higher level service school attendance and promotion, there are some important secondary uses. These are in the area of career branch follow-up. The detailed analysis of an officer's record not only establishes his position on a particular OML; it may also highlight professional development needs. This information may then affect assignment actions and be used during officer counseling.

Officers who wish to know their standing on a particular OML may contact their branch and request the information. They will be informed of their standing by thirds (upper, middle, or lower), provided they are on a recent OML. Exact numerical OML standings are not given because exact standing fluctuates as recent evaluation reports and other information affecting OML development are noted by the branches. More importantly, exact OML standing at a given point in time tends to imply a degree of precise discrimination that does not exist.

The OML standing indicates an officer's order of merit, relative to other eligible officers of his branch, **for a particular personnel action.** It should be remembered that this relative position forms the basis for branch **selection** of officers for the command and staff colleges, and for **submission** of OML's for **consideration** by Department of the Army promotion and school selection boards.

This article describes airspace management and air defense results during Brave Rifles VII field training exercise (FTX). The views expressed are those of the participating units, the 3rd Armored Calvary Regiment (ACR) and the 11th ADA Group, and reflect experiences related to the scenario of the exercise.

FTX Brave Rifles VII employed friendly and Aggressor forces in a corps scenario which required the 3rd ACR to act as a covering force for a corps conducting an advance to contact operation. Frontages for the 3rd ACR-were 50-70 km. All 3rd ACR organic and attached units participated along with the two major 11th ADA Group units, the 5th Bn, 59th ADA (C/V), and the 2d Bn, 55th ADA (Hawk) (Towed). The 5th Bn, 59th ADA (C/V), was employed in direct support (DS) to the 3rd ACR while the 2d Bn, 55th ADA (Hawk), was in DS of the 3d ACR in its covering force mission. The organic Redeye sections of the squadrons were under operational control (OPCON) of the C/V battalions. Both friendly and Aggressor forces were subjected to highly sophisticated electronic warfare (EW).

Because of the realistic frontages and depths of maneuver areas at Fort Bliss, the 49 helicopters of the regiment were comparable to the number of helicopters organic to an armored or mechanized division. The 5th Bn, 59th ADA (C/V), in DS of the regiment, is the same ADA organization that is organic to armored/mechanized divisions. Because of these facts, many of the lessons learned are applicable to division operations.

LESSONS LEARNED

Airspace Management

• The present modification table of organization and equipment (MTOE) configuration of the regiment is not adequate because it does not provide for an Army aviation element (AAE) in the command post, nor are authorized radios satisfactory. A fundamental problem is determining the type of radio that is compatible with the limited range of aircraft radios flying nap of the earth (NOE) over the great distances covered by the regiment. FM, UHF, and VHF radios were all used in the FTX, all of which proved to be unsatisfactory.

• One flight-following net, with adequate radio coverage, can control and coordinate Army aviation within the regimental zone of action. The AAE must be able to communicate with every helicopter in regimental airspace.

• The present use of regimental points of origin to control flights is effective, but more should be used.

• Problems encountered by nonregimental aircraft in regimental airspace can be solved through advance flight planning and effective liaison. No aircraft should enter regimental airspace until cleared by the AAE.

• Regimental airspace should extend to 200 feet above ground level, and all flying in regimental airspace should be NOE.

• Present points of origin used are translatable to the Hawk radar grid system; however, the translation problem in the Army air defense command post (AADCP) is compounded by the different grid system used by the C/V battalion, thus imposing three systems on AADCP personnel. To simplify the problem, the point of origin system should be translated to the C/V grid system in the regimental air support/fire support coordination center.

• Electronic warfare can seriously affect Army aviation control due to the inadequacy of radios, NOE limitations, and extended communications distances.

Tactical Air Support

• The airborne forward air controller (FAC) can survive only if he is out of engagement range of enemy missiles and forward area weapons. In an intense, hostile air defense environment, the tactical air coordinator (airborne) in a high-performance aircraft would have better survivability, but with a loss of overall effectiveness. The 3d ACR air liaison officer (ALO) states that the airborne FAC can survive if electronic warfare and flak suppression are used to defeat ADA missiles and forward area weapons.

• The ground FAC can better control and adjust air strikes if he can see the target. The FAC must have the cross-country capability of the tracked vehicle to move laterally across the battlefield. The FAC must receive intensive training and practice in cross-country navigation.

• One FAC for a squadron, covering frontages from 10-15 km, is obviously inadequate. The optimum situation would be one FAC per troop unit on line and an ALO with the squadron command group. Current Air Force or Army assets cannot presently support such a requirement.

• ALO's at both regimental and squadron levels must coordinate with S3 Air, Army aviation, air defense artillery, and artillery elements to insure that friendly air strikes are included in airspace management.

Redeye

• The MTOE radio of the Redeye section is inadequate. The AN/PRC-77 radio remaining with the Redeye team, since the loss of vehicles due to the DA Wheel Study, lacks the range necessary to operate over extended frontages. The AN/VRC-47 radio should be available to every team. The auxiliary receiver would allow the team to net with the FM early warning capability of the C/V battalion, thus becoming fully complementary and integrated with Chaparral/Vulcan.

• Redeye teams are improperly mounted. Four of the six teams at squadron level should have the tracked, cross-country capability of the M113A1 to protect the maneuver units. Additionally, the M113A1 offers sufficient basic load space and the mounting space for the required AN/VRC-47 radio configuration. These MTOE changes will be recommended to include an RD-292 antenna for the section leader so that he may communicate more effectively over extended distances.

• Placing squadron Redeye sections under OPCON of supporting C/V batteries is valid. Some inherent problems exist in the areas of communications and training, the latter being easily overcome.

• When a C/V battery is available to the squadron, the C/V battery commander, not the Redeye section leader, should provide the air defense element (ADE) in the squadron CP. By placing himself in the CP, the battery commander can monitor the tactical situation and can better employ his units. The Redeye section leader is then free to command and control his teams.

• The effectiveness of Redeye at night was not determined due to the absence of moonlight. The Redeye sight should be redesigned to provide a

wider field of view and an illuminated reticle.

• The current ATT 44-3 for the Redeye section requires considerable alteration to fit an actual squadron ATT/ORTT. The Redeye section should be evaluated concurrently with the squadron to permit a realistic evaluation that includes integration with C/V and actual tactical air support. Live firing of Redeye should be included.

Chaparral/Vulcan (C/V) Employment

• A C/V battery is not capable of providing air defense for all elements of a squadron deployed in a zone or sector. So as not to dissipate AD assets, C/V battery commanders were directed to defend in the following priorities: howitzer battery, combat trains, and squadron CP. All other elements were required to employ passive measures and, only if engaged, crew-served and individual weapons for air defense. In practice, deployment of those elements of a squadron to be defended by AD was restricted to areas compatible with a C/V battery (1 Chaparral/2 Vulcan platoons) coverage.

• Squadron Redeye sections, operationally controlled and deployed by the C/V battery commander, effectively complement C/V by permitting protection to maneuver units and/or augmenting C/V protection of the howitzer battery, squadron CP, or combat trains.

• The mix of Chaparral and Vulcan batteries within a C/V battalion should be changed from the current organization of two Chaparral and two Vulcan batteries per battalion to three Vulcan and one Chaparral battery per battalion. This will enable the C/V battalion commander to continue to weight Vulcan forward while retaining the capability of a C/V mix for the regimental trains or as needed elsewhere. Under the current organization, the only way Vulcans can be weighted forward is to defend other regimental critical assets (e.g., trains) with only Chaparral. The Chaparral battery TOE should be changed to provide each Chaparral platoon leader a track vehicle to achieve the same ability as that of the Vulcan platoon leader to command and control his fire units

• Considering the extended frontages of the regiment, electronic warfare can seriously disrupt early warning and command and control capabilities of C/V.

• When in DS of the regiment, the C/V battalion trains should collocate with the regimental field trains, then resupply of C/V batteries can be coordinated with the night resupply of the regiment, thus taking advantage of existing convoy ground protection by combat units.

• The squadron's CP should key its movements on the howitzer battery, thus permitting an easier C/V deployment for those two elements.

Hawk Employment

Towed Hawk demonstrated sufficient mobility to support the regiment while the regiment was acting as a corps covering force. Employment considerations as a result of the exercise were:

• The regiment does not have sufficient assets, when deployed over extended distances, to protect Hawk fire units or their CP's.

• Hawk units and CP's are extremely vulnerable to airmobile assaults and surprise enemy penetrations.

• Movement of towed Hawk units is somewhat restricted to good road networks. Half of the unit moves were made at night or early dawn to reduce the high risk of daylight moves.

• The Hawk unit providing regimental air defense coverage was placed to afford the air defense commander the latitude of placing the major portion of the Hawk unit in the forward or flank position of the regimental area of operations. Augmented assault fire units were displaced temporarily to provide the regiment extended coverage. As stabilization of the tactical situation occurred, main elements were also relocated. Augmented assault fire units proved able to relocate in 30 minutes.

• The use of one Army aviator in the FTX as liaison officer (LO) to the Hawk AADCP was not sufficient for 24-hour operations. Two LO's would be adequate; however, like the AAE at regiment, neither the spaces nor communications are presently authorized in the MTOE. Because of the potential distance between the AADCP and the regimental CP, the long-distance capability of AM radio should be considered to offset FM radio limitations.

• During the FTX electronic warfare play against the Hawk battalion was limited; however, the extended distances between Hawk units make them as vulnerable as any other unit.

• If forward Hawk units operate approximately 20 km behind lead regimental units, radar coverage beyond the lead units would dictate the frequency of displacement. Assuming the ACR can move 6 kmph cross-country in the desert in a covering-force type operation, Hawk displacement by platoon and/or fire unit echelon will be, by necessity, continual.

Self-paced Instruction (A Break With Tradition)

Major Richard A. Davies
SFC Rannie Davis
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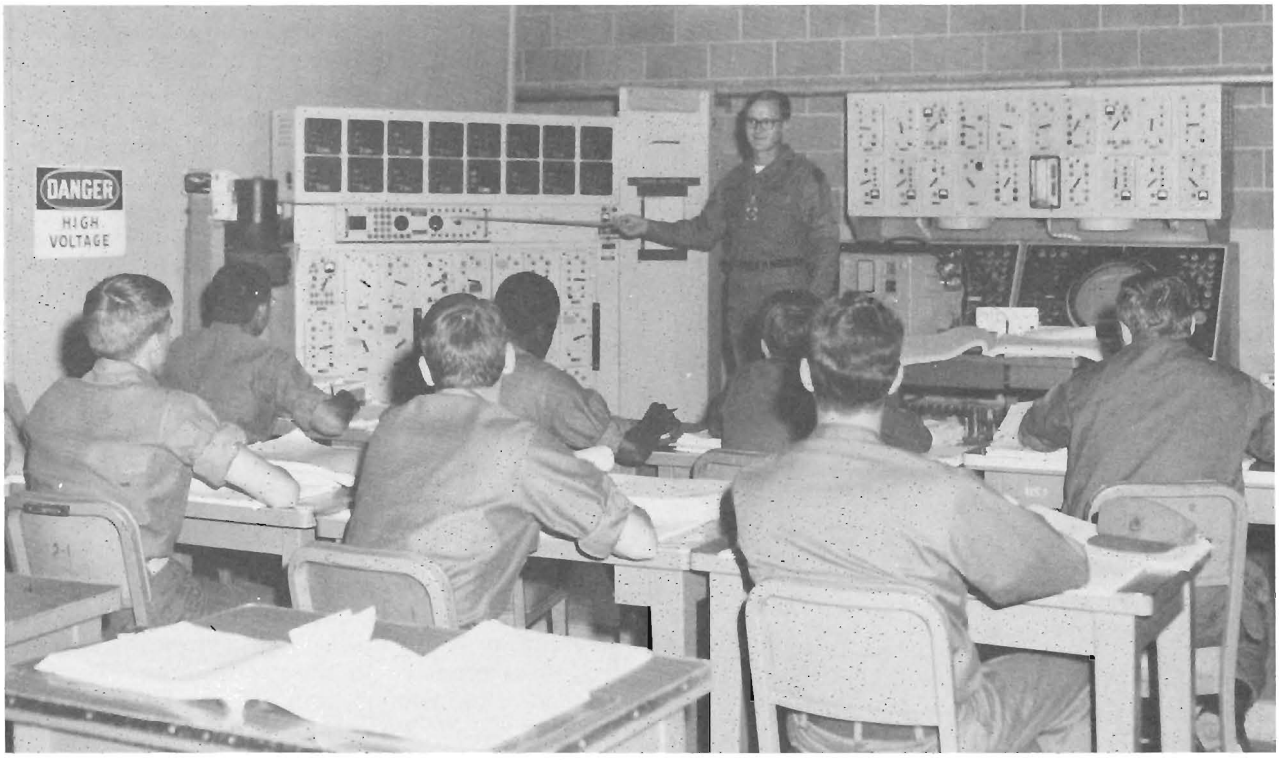


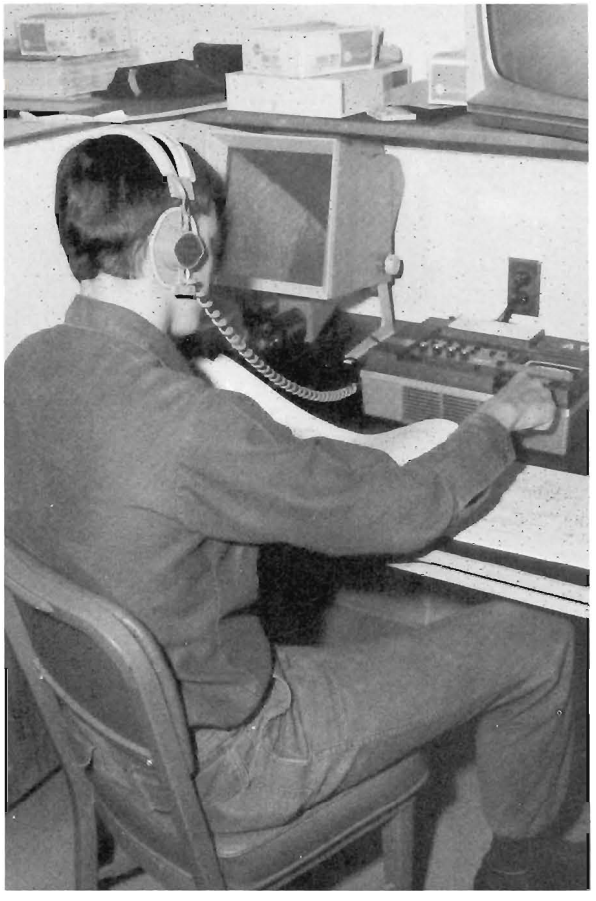
Expounding tradition is a useful means to promote esprit in the military, but there are times when a break with tradition may be necessary to get a certain job done more expeditiously and effectively. Traditionally, the military approach to instruction has been to form students into classes and present instruction to each class for whatever length of time was considered necessary for the average student to absorb the material. Everyone in the class started the course at the same time and completed the course at the same time. Now, at the US Army Air Defense School, an innovation called self-paced instruction (SPI) is being evaluated to determine whether this might be a better method to train military students for selected skills.

Basically, self-paced instruction is a training system whereby an individual student accomplishes a given training objective at his own individual speed. The student can start a course at any time an opening is available, proceed through the course at his own rate, and be on his way to his next assignment in minimum time. Students don't wait for a class to form and no more time is spent in school than what is necessary to effectively absorb the instruction.

Self-paced instruction provides a controlled environment that stimulates and challenges the student and allows him to work freely. Under the SPI method, a student is oriented to course objectives and mechanics, introduced to his faculty advisor, and promptly begins the course. Using special texts, training aids, and classroom facilities, the student goes through an inresidence correspondence course at his own rate. When a student's rate is observed to be too slow, his faculty advisor will step in to offer assistance. The student who does not maintain satisfactory progress or attitude may be relieved from the course.

Individual learning stations are replacing the traditional 20-30-man classroom. A learning station will contain special training devices including mockups of equipment, component circuit boards, synchronized slide projector tape recorder, and a

video cassette set. A typical day for a student in an SPI course will be noticeably different from the normal classroom approach. A student is assigned a block of instruction and provided a learning station for a specific number of hours. His assignment is based on his learning rate and point of progress in the course. It may be necessary to schedule a slower student 5 hours at a learning station to study a certain block of instruction, while a superior student may need the station only 3 hours to study the same material.



After completing a block of instruction, the student is administered a short test to verify that he has met the required training objectives and is ready to proceed to the next phase of instruction. For example, in a course such as radar maintenance, the first phase is done at a learning station, but the second phase is completed using the actual equipment. While on the actual equipment, an instructor monitors the student's actions for academic evaluation and safety. Throughout the course the student alternates between the learning station and actual equipment.

By spending most of his time in a self-study environment, a student does miss out on some intangible benefits of group discussion, exchange of ideas, and association with other students. To compensate, discussion seminars are scheduled periodically throughout the course whenever beneficial.

Self-paced instruction is not only different from the traditional classroom approach, it is considerably expensive. A relatively large number of man-hours and money for special training aids and facilities must be spent to develop a single SPI course. Two factors must be considered when evaluating the desirability of SPI: self-paced instruction provides military educators with an effective alternative to the traditional classroom method of instruction; and SPI can be applied to many types of technical subject training courses to produce highly skilled and qualified technical graduates.

Switzerland's Skyguard Fire Control System

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Switzerland's state-of-the-art in weapons fire control systems is incorporated in the "Skyguard" modular unit displayed at the 1973 Paris Air Show. It was judged by military observers to offer "significant advantages" over the widely used "Superfledermaus."

Compact and capable of configuration with guns or missiles, Skyguard is, like the Superfledermaus, a development by Contraves A. G. of Switzerland. The system features combination search and track doppler radars, a TV-tracker, digital signal processing, and a frequency diversity capability. It is expected to be deployed in the 1980's.

Designed for mounting on a truck, trailer, or

tracked vehicle, Skyguard reportedly is capable of giving fire-control information to on-board and off-board missiles, or to off-board gun systems. It also can be used as a fire direction center by providing surveillance and target acquisition information to additional fire control radars.

Separate pulse doppler search and track radar antennas are mounted on a common pedestal. A common transmitter, operating at I-band frequencies (8 to 10 GHz), feeds both antennas through a variable power splitter. The search antenna is a cassegrainian-fed pillbox rotating at 60 rpm.

The tracking radar also uses a cassegrainian antenna encased in a radome and has a monopulse tracking capability. The TV tracker is boresighted with the tracking radar antenna for additional accuracy. Most of the RF power is fed to the search radar until target acquisition. Once a decision is made to engage, RF power can then be split. The search radar can continue the search during the tracking mode.

The fire-control system uses two operators inside the van. The console has a PPI (plan position indicator) and A/R (azimuth/range) displays plus a screen for the TV tracker. One operator will operate the PPI during search and handle an adjacent matrix panel for data entry and retrieval. A rolling-ball is used to control the markers on the scope. The other operator will use the A/R display and the TV screen to handle target engagement and monitor the ECM (electronic countermeasures) environment. A joystick in front of the TV display can be used for manual or aided-rate tracking.

The radars can track two targets simultaneously and switch instantaneously to the target chosen for engagement. The intercept point is then displayed on the operator's console. An alarm is sounded if the radar detects the launch of an air-to-ground missile.

Signal processing is performed digitally in "real time" by the Contraves CORA II M solid-state digital computer that performs threat evaluations based on information derived from the search radar.

Capable of calculating firing data for both guns and missiles, the computer monitors the Skyguard subsystems, automatically performs functional and performance checks of the system, and can provide operator training by simulating combat situations. A digital data transmission system is used to pass target and aiming data.

The body of the Skyguard module unit is constructed or reinforced fiberglass, weighs about 4 tons, and is compact enough to fit in a Cheyenne helicopter. The system employs two 400-Hz Bendix generators, housed together. The unit is removable for external operation.

One of the generators provides power for the digital equipment and the other powers the radar system. The trailer version can be prepared for action in 10 minutes for missiles or 15 minutes for guns.

Coarse leveling of the trailer version is manually controlled but fine leveling is automatic. Both antennas and the TV tracker are folded into the Skyguard module for travel.

Compared to the Superfledermaus, the Skyguard offers distinct advantages in versatility, compactness, and capability. It can be used as a focal point for operating gun and/or missile systems by incorporating search, target acquisition, and tracking function — all in a compact, mobile package. Skyguard illustrates the modern trend in fire-control system development and serves as an excellent example of what can be expected to be deployed in the 1980's.

-Army Research and Development

Physical Fitness - The Misfit of Total Military Fitness

Lieutenant Colonel William J. Weafer
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There is indeed no question that in the present day Army, with a sharp reduction in available manpower and with stringent priorities established for the accomplishment of mission requirements, something must give. In any situation where time is of the essence and tasks are accomplished by priority, things that can most conveniently be neglected will be neglected. All too often the physical fitness of the individual soldier holds a low priority. It is not only neglected but deemphasized.

On the other hand, all commanders are well-versed concerning the various ramifications of unit readiness and know their responsibilities. Key pitfalls are well established, such as operator training, preventive maintenance, safety, modification work orders, schools, and equipment operation. They are familiar with equipment serviceability criteria and are able to discuss repair parts, tools, and publications with the specialists. This is commendable. It is also a very necessary condition if the unit is to accomplish its mission. Unfortunately, too few commanders understand or are concerned about the physical well-being of their men.

Lieutenant Colonel Weafer graduated from the United States Military Academy in 1954, obtained a Masters Degree in Physical Education at the University of Oregon in 1965, and subsequently served as an instructor in the Department of Physical Education at West Point until 1968. He has served in Vietnam and is currently commanding the Student Battalion of The School Brigade, US Army Air Defense School.

Most readers will probably agree that commanders do have an appreciation for the technical fitness of their units. Psychological fitness is also emphasized. Through monthly troop information classes, commanders insure that all men are instilled with the incentive and the will to fight. It is the third aspect of total military fitness — physical fitness, or the strength and endurance to fight — that is so often neglected.

Militarily, the fit man is obviously the more valuable and effective soldier. In combat, where the unexpected is the order of the day, the fit soldier is prepared to meet emergencies and to counter them effectively. He is more agile, can hit the ground instantly, and return accurate fire immediately. When endurance is called for, he can perform over long periods of time without undue fatigue. If wounded, he is better able to withstand the injury and has a better chance for survival. He is combat ready. Is this not important?

A young man entering the service today finds a situation similar in many respects to the one he left at home. Technological advances have changed the Army and strenuous physical exertion is now a thing of the past. Even in the service, for many a day's exercise consists largely of the effort expended in going to and from one's place of duty. As a matter of fact, much of today's work-saving automation found in everyday living can be attributed to research that was initially conducted by, or for, the military service. Thus, the military is certainly not exempt from the trend which has seen physical work output performed by man drop from 13.0 percent of the total work output in 1850 to a low of 0.9 percent in 1950. It was estimated that in 1950 machines were averaging 98.5 percent of the total work output. With the advances in

technology during the last 20 years, it is possible that work performed by humans may now be as low as 0.4 percent of the total output.

Since vigorous activity is essential for optimum health, and since physical work output in the United States has been almost completely replaced by machines, we should be receiving the message loud and clear, "exercise - or else."

The question remaining at this point is rather obvious, "What kinds of exercise are most effective?" Actually, any strenuous exercise that causes one to perspire freely is an effective conditioner. Running and jogging are two of the best all-round conditioners, with swimming a close contender. Unfortunately, both running and jogging can be extremely monotonous. Sports, such as tennis or handball, are also good conditioners and are usually thoroughly enjoyable to the participants. The catch here is that the more skilled one becomes in these sports, the less conditioning may result from the same amount of play. A point to remember is that the conditioning to be derived from a doubles contest in handball or tennis is considerably less than that derived from singles. It is best to go it alone — remember that strenuous exercise is the key. Sports such as golf and bowling are excellent forms of relaxation, but rather limited in their conditioning effect.

To allow all personnel to participate, regulations should prescribe and commanders should encourage several 1- to 2-hour periods of exercise each week. Much more toward conditioning could be accomplished in short periods every other day than during the customary afternoon off each week for recreation.

A case has been presented for the need of an improved awareness, or an increased appreciation, among commanders, for the importance of the physical fitness of the men they command. The third aspect of total military fitness, physical fitness, is equally as important as the skill to fight and the will to fight.

OPMS Specialty: Foreign Area Officer

Major Joseph M. Lukitsch
Introduction by Lieutenant General Donald H. Cowles,
Deputy Chief of Staff for Operations and Plans

As many of you ponder your decision on which alternate or advanced specialty to select under the Officer Personnel Management System, I welcome the opportunity to provide information on a specialty that for many will provide both a challenging and rewarding future.

I believe that the skills of the Foreign Area Officer (FAO) are central to the Army's participation in the achievement of major objectives of US national security and foreign policy. Today's Foreign Area Officer is mission-oriented; he shapes rather than reacts to events, handling complex programs and issues rather than merely organizing solutions to problems.

What are the implications for the FAO in the future? With the development of a professional group of officers skilled in politico-military affairs and trained in the detailed knowledge of a foreign region, its people, language, and customs, the Army will experience an increased capability to foster an international military linkage bonded in mutual trust, confidence, and respect. Today's FAO's are working as strategists, long-term planners, and as monitors of foreign military sales/credit programs on Department of the Army and Joint Staffs. By virtue of their area expertise and their experience in dealing with problems of national strategy, FAO's are participating in the State-Defense Department Exchange Program and are assigned to Department of Defense and Joint Chiefs of Staff positions. FAO's are influencing Army policy and doctrine, working on area studies, and, in a few select cases, acting as consultants where personal friendships established with foreign governmental officers are required in emergency situations.

In the final analysis, the success of OPMS will depend upon the interface of your skills and career interests with the needs of the Army. Both should be mutually enhancing. The Foreign Area Officer Specialty is for the farsighted young officer, for the "hard charger" as well as the "policy thinker." I encourage you to examine this specialty before you make your decision.

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Increasing worldwide requirements for officers trained in politico-military and security assistance affairs place an even greater demand on the US Army for officers trained in fields that do not conveniently fall into the traditional officer development patterns of any single career branch. To meet this challenge, the Army has established the Foreign Area Officer (FAO) Specialty.

Lieutenant General Cowles
Deputy Chief of Staff
for Operations and Plans

The specialty's purpose is to identify and develop officers for challenging politico-military and security assistance assignments, encompassing high levels of individual responsibility throughout the Department of Defense. The Commanding General, MILPERCEN, Department of the Army, directs the FAO Specialty within the policy guidance of the Deputy Chief of Staff for Personnel, and with the technical assistance and advice of the Deputy Chief of Staff for Operations and Plans (DCSOPS).

Although the Foreign Area Officer is new (a merger of the former Military Assistance Officer (MAO) and Foreign Area Specialty (FAS) Programs), the individual fulfilling the role is not. Shortly before World War II, Army commanders and staff officers found themselves thrust into assignments overseas that required the exercise of skills and judgments not traditionally associated

with the duties of Army officers in field units. Under their command were thousands of US troops working in social, cultural, political, and economic environments vastly different from those of the United States. Commanders were faced with new and continuing challenges to ensure harmonious coexistence with foreign peoples — a task for which the majority has received little or no specialized training.

The post-World War II period saw the establishment of MAAG's and Missions, extensive military involvement in emergencies threatening developing nations, and the rebuilding of nations devastated by the war. Commanders and staff officers acquired a new role — that of advisors to foreign military personnel at all levels. They were often seriously handicapped by language barriers, cultural gaps and inexperience in the techniques of assistance to developing nations.

In that challenging, complex, and changing world, outstanding leaders came to the fore. Professionals such as Generals George C. Marshall, Douglas MacArthur, and Dwight D. Eisenhower applied their politico-military talents to meet the needs of the nation. They were the prototypes of the professional the FAOS is designed to produce — fully qualified and experienced commanders or staff officers who are additionally trained in fields related to foreign internal development and assistance and politico-military activities.

More recent developments under the Nixon Doctrine, including the rapprochment with the People's Republic of China and closer relations with many eastern European and Asian countries, point to increasing Army requirements for officers who possess in-depth knowledge of specific countries, cultures, and areas of the world. Also, as our oversea forces are reduced, the oversea military interests and commitments carried out in US embassies, military missions, military groups, and advisory teams assume increasing importance.

The merger of the MAO and FAS Programs into the FAOS, on 10 March 1972, broadened opportunities for members in key assignments throughout the world. FAO members are assigned to positions in Unified and Major Army commands; Department of the Army; MAAG's, Missions, and MILGP's; the Attache System; DIA, JCS, and as instructors at the US military academies, Senior Service Schools, Institute of Military Assistance, and branch service schools. The FAOS provides a unique opportunity to serve the nation overseas in sensitive politico-military assignments.

Over 600 positions have been identified as FAO positions worldwide. The following general information is provided to reflect the spread of FAOS positions in the functional duties of instructor, attache, security assistance, intelligence, plans and operations, CA/UW/PSYOP, and command.

- Instructors: Army War College, Armed Forces Staff College, US Army Command and General Staff College, US Military Academy, US Air Force Academy, USA Institute for Military Assistance, School of the Americas, and branch service schools.
- Attaches: All Army attaches are validated FAOS positions.
- Security Assistance: Advisors assigned to Unified Commands (EUCOM, SOUTHCOM, PACOM) working in MAAG's and MILGP's.
- Plans and Operations Staff: OASD (ISA); JCS (J3, J5), Unified Commands (J3, J5, J7); DIA: HQ, DA (ODCSOPS, OACSI); Army Commands (USAREUR, USARSO, USARPAC).
- CA/UW/PSYOP: Corps and Division G5's, Group/Battalion/Detachment Command; Special Forces, Civil Affairs, Psychological Operations and Military Intelligence Groups/Battalions/Detachments.

Over 200 colonel positions have been validated within DOD and DA with 200 positions for lieutenant colonels and approximately 200 for majors and captains.

As of 1 July 1974, there were over 1,200 members of the FAO specialty.

Entrance to the Specialty

In general, the prerequisites for entering the FAO specialty are:

- Be a member of a branch other than Medical, JAGC, or Chaplain.
- Have three years branch experience to include completion of branch advanced course.
- Have a baccalaureate degree.
- Have demonstrated a high level of intelligence, initiative, imagination, and judgement, and the potential for advancement to positions of great responsibility.
- Possess a high language aptitude (22 or higher on the Defense Language Aptitude Test).
- Agree to incur a 4-year commitment upon completion of training.

Education

An officer in the specialty may be scheduled for attendance at one of the US Army Institute for Military Assistance Officer Courses and also be considered for advanced civil schooling. The opportunity to attend graduate school for selected members is increased because priority is given to specialty members to fill civil school quotas. In FY 75 a total of 45 quotas were approved for training in the FAOS. These allocations were given to the branches for assignment of officers to civil schooling in foreign area officer-related disciplines.

FAOS members are encouraged to apply for advanced civil schooling in several FAOS-related disciplines: Anthropology, Area Studies, Economics, History, International Relations, Foreign Affairs, Civil Government, Military Government, Social Psychology, General Psychology, Political Science, Sociology, and Social Science. Additionally, Language, Literature, and Public Administration have recently been added as FAO-related disciplines. All validated positions in the FAOS are approved for advanced civil schooling. All of the key positions are validated for advanced degrees.

As for military education, an officer may apply to attend the Foreign Area Officer Course, Security Assistance Management Course, or a related course at the US Army Institute for Military Assistance.

Promotion

Promotion lists for 1974 show that one member of the FAOS was selected for promotion to brigadier general. Twenty members of the program made the colonel's list. Of the 41 considered, 18 were selected. The FAOS selection rate for colonel was 41.5 percent. This compares favorably with the Army average for first time selection of 37.5 percent. Promotion to lieutenant colonel is even more impressive. Of the 53 program members considered for the first time, 50 were selected. The FAOS selection rate to major was 98 percent compared to the 58 percent Army average. Other advanced entry specialties also experience a higher percentage of selection for promotion.

The OPMS Concept

The specialty under OPMS provides a system to produce officers who are both branch proficient and FAO proficient. The specialty is not a substitute for — but a complement to — the officer's basic branch. While each officer should develop generalist capabilities, it is also wise to pursue a specialty in which to serve between branch assignments. This is especially important in light of the OPMS concept.

- Military Schooling Phase. Attendance for selected members at the Command and General Staff College or equivalent; Foreign Area Officer Course, Security Assistance Management Course at Fort Bragg, NC; Defense Attache School, Washington, D. C.
- Advanced Civil Schooling Phase. This phase consists of graduate schooling for selected members in an FAO related academic discipline.
- Language Phase. This phase of training consists of 6-12 months of language instruction at the Defense Language Institute or other designated language facility. Language training may be omitted for officers possessing a current fluency of S3/R3 in an appropriate language.
- Oversea Phase. Most oversea training consists of 12 months travel, research, and study in the area of specialization. Six additional months are authorized for officers who attend a host country C&GSC level course. The USSR/East European program consists of 24 months at the US Army Institute for Advanced Russian and East European Studies in Garmisch, Germany, and travel to Eastern Europe. The China program includes 12 months of study at the State Department's American Embassy School of Chinese Language and Area Studies on Taiwan, and an additional year of travel, study, and research in countries on the periphery of China.

Release From the Specialty

Officers may be released from the FAOS for any of the following reasons:

- Changes in the projected specialty requirements for the total number of officers required.
- Failure on the part of the officer to demonstrate the desired progress in development, duty performance, interest, or aptitude.
- Other reasons which indicate that further participation in the specialty is not warranted.
- Written request by the officer.

There are conditions attached to release from the specialty. If an officer has attended advanced civil schooling under FAO allocation, he must complete a prescribed "utilization" tour before release. Release from the program, however, does not preclude assignment to duty in the FAO Field or oversea duty at a later date.

In conclusion, the establishment of the FAOS is the Army's effort to foster, preserve, and nourish political-military and security assistance skills within the officer ranks. Under the Officer Personnel Management System, FAOS is firmly committed to bettering the defense establishment's scorecard in the policital-military and security assistance fields. The availability of officers skilled in these fields is central to the Army's participation in the achievement of major objectives of the US national security and foreign policy worldwide.

Interested officers should direct inquiries for specialty participation to their respective career branches.

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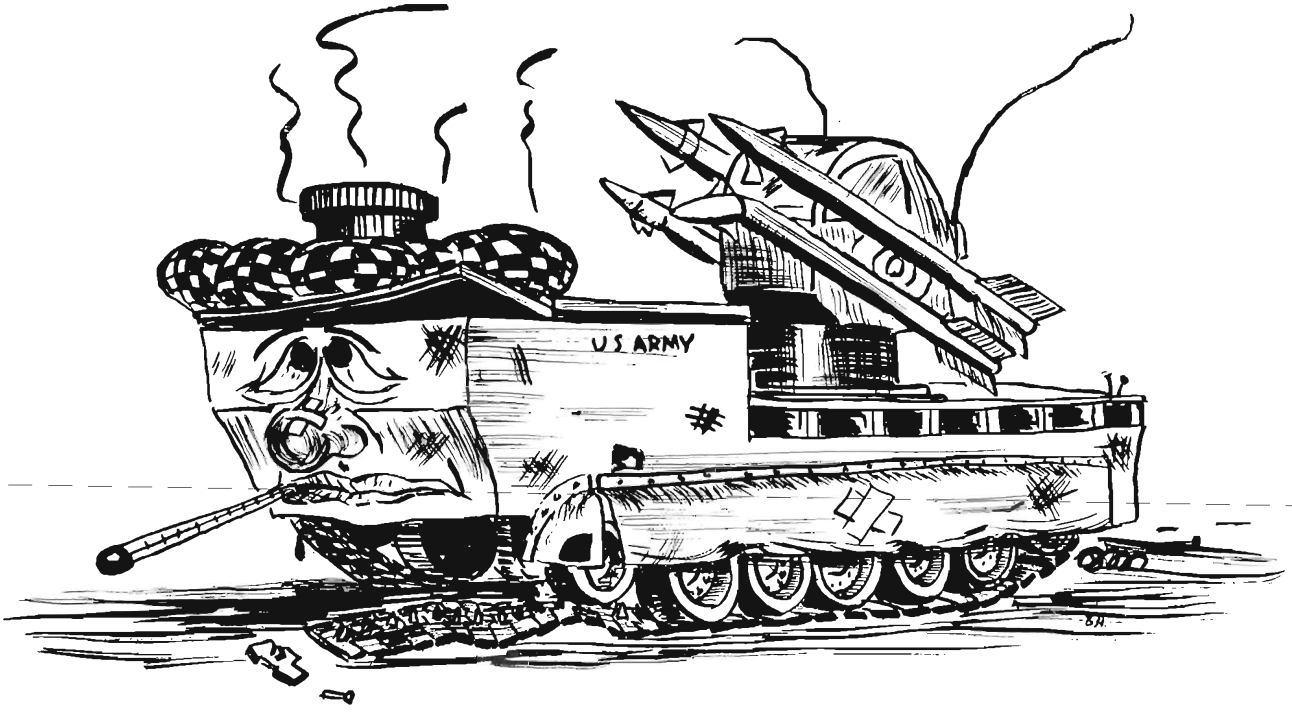
Wanted: A Supply System Responsive to Chaparral Maintenance Demands



This article was written by a team of students attending the 2-44-C22 Course consisting of CPT's Paul E. McCarthy, Elmer O. Amacker, Sheldon J. Gerron, and Albert W. Beaton. It is not to be construed as US Army Air Defense School doctrine.

The original Combat Developments Command (CDC) concept for Chaparral/Vulcan organizational maintenance was that battery maintenance personnel would replace assemblies, subassemblies, and piece parts, such as printed circuit cards and relays. In the case of the Chaparral weapon system, US Army Missile Command and the contractor proposed that organizational maintenance personnel be limited to changing modules or "black boxes.". This concept was accepted based on the assumption that each Chaparral firing battery would be authorized to stock one module for each like module in the weapon system; also, that the initial basic load of repair parts would be delivered concurrently with the end item to the newly activated using unit. In the case of the Vulcan weapon system, US Army Weapons Command and the contractor basically adhered to the original CDC concept for organizational maintenance.

Chaparral is the only air defense weapon delivered to the user in the past 15 years that has not received its basic load of repair parts as an automatic issue with the major end item. When Chaparral fire units arrived in Europe and deployed with the division without their basic load of repair parts, it was estimated that the prescribed load list (PLL) and authorized stockage list (ASL) to support these air defense weapons would approach $460,000. The division and theater commands were not funded for such a purpose. The cost of some of the modules for the Chaparral system is:

Power Supply	$23,940.00
Mount Drive Control Box	13,284.00
Missile Control Electronics	12,624.00
Control Box Relay	4,374.00
Panel Launcher Control (RH)	3,547.00
Panel Launcher Control (LH)	6,239.00
Distribution Box	4,727.00
Distribution Box Mount	6,095.00

The list indicates a cost of over $70,000 per battery to stock modules at the battery level and could exceed $96,000 if all applicable modules were

stocked. Consequently, only 1 or 2 modules are being stocked, not at unit but at general support level. Futher aggravating the problem are repair part supply procedures which hold direct exchange (DX) items at the general support unit (GSU). The GSU has been able to fill approximately 25 percent of the DX requirements. With the PLL and ASL so low in quantity, the AD unit must usually dead-line a fire unit to take a module to the direct support unit (DSU) for DX in turn to a GSU. Obviously, the concept of module replacement is not as successful as it was envisioned to be.

Chaparral air defense artillery units have the capability of fault isolation to printed circuit cards and relays in the modules with currently authorized test equipment. Although this capability does not extend to all cards, it does afford the unit a far greater capability of maintaining operational readiness with low-cost printed circuit cards and relays than high-cost, and presently unavailable, modules. Also, the organizational maintenance man can put the fire unit back on the air more rapidly by card replacement than by disconnection, complete removal, replacement, and hookup of large module assemblies that take an average of 2 manhours to replace. Such maintenance procedures at organizational level follow the original maintenance concept. During field visits, DSU's recommended Chaparral organizational personnel be authorized and required to replace faulty printed circuit cards in the weapon system, and that the DSU repair these cards.

Responsive maintenance of Chaparral is degraded by other maintenance procedures. In Europe, Chaparral direct support units replace the faulty printed circuit card or cards and then evacuate cards to CONUS where the card is repaired at Red River Army Depot and returned to stock. Priority 02 requisitions for Chaparral printed circuit cards require 85 days order and shipping time to the using unit. However, Vulcan organizational maintenance personnel maintain operational readiness through replacement of printed circuit cards. The direct support unit is authorized to conduct fault isolation and card repair. Vulcan, a much heavier maintenance burden, receives more responsive maintenance support than the Chaparral.

Chaparral and Vulcan weapon systems represent equipment fielded and supported under two ordnance commodity commands for electronic equipment. Electronics Command, a signal commodity command, publishes a maintenance support plan (MSP) on the AN/TPX-46, advance general purpose interrogator, a more complex piece of electronic equipment than the Chaparral or Vulcan. The MSP authorizes repair of defective printed circuit cards at DSU level. The forward area alert radar (FAAR, MICOM developed and supported) will have faulty printed circuit cards repaired at DSU level. The FAAR is supported by the same DSU that supports the Chaparral/Vulcan battalion.

AR 750-1 authorizes organizational maintenance to isolate and replace defective printed circuit cards or boards and subassemblies, and authorizes the DSU to repair these items. Repair of printed circuit cards is improved by an advanced electronic repair kit called "Pace Equipment." This equipment is in the hands of personnel and is being used expertly. The monitoring of Vulcan operational readiness is directly tied to the use of this equipment at DSU level. In addition, the equipment provides emergency backup for repair of Chaparral printed circuit cards, when these cards are not available through normal supply channels.

Maintenance concepts, parts manuals, and technical manuals for Chaparral should be amended to state the concepts originally advocated by CDC and listed in AR 750-1. Chaparral organizational maintenance personnel should be allowed to fault isolate and replace assemblies and subassemblies (printed circuit cards) and make repairs using appropriate piece parts. Chaparral DSU's should be allowed to fault isolate, repair, and replace printed circuit cards.

Recently, the direct support logistics commander in Europe authorized the removal of Pace Equipment from the Chaparral/Vulcan DSU. This action will force Chaparral/Vulcan units to rely on an excessive order and shipping time for replacement of faulty printed circuit cards. The ultimate result will be a lower state of operational readiness of C/V.

A Salute to USAFI

With diminishing military appropriations and concomitant reductions in military strength come the elimination of certain supporting activities and institutions. One of the more valuable of such institutions. the United States Armed Forces Institute (USAFI), was recently directed by Congress to terminate operations. Because of the commendable contributions USAFI, in 32 years of operation, has made to the military services and thousands of individuals, **Air Defense Trends** wishes to pay tribute to this remarkable organization by informing our readers about its noteworthy accomplishments.

USAFI fashioned its creed around this quotation from the Rockefeller report on education entitled, "The Pursuit of Excellence."

> *The greatness of a nation may be manifested in many ways - in its purpose, its courage, its moral responsibility, its culture and scientific eminence, the tenor of its daily life. But ultimately the source of its greatness is in individuals who constitute the living substance of the nation. A free society puts at the very top of its agenda the opportunity of the individual to develop his potentialities.*

The mission of USAFI has been to provide educational services and materials on subjects normally taught in civilian academic institutions (to include graduate level) in fields providing opportunities for the professional development of members of the Army, Navy, Marine Corps, Air Force, Coast Guard, and the three service academies.

During its tenure, USAFI offered three distinct educational programs. First, a program of courses was developed by the United States Armed Forces Institute. These were courses at the pre-high school, high school, college, and occupational levels. The courses were taken either by independent study or by class instruction in which a military installation procured a qualified instructor. USAFI also developed and offered 12 courses at the pre-high school level, 51 courses at the high school level, 89 courses at the college level, 53 courses in spoken languages, and 25 occupational courses for a total of 230 courses.

Second, the participating college and university program made available some 6,000 courses offered by colleges and universities. Approximately 25,000 persons enrolled annually.

Third, the USAFI Core-General Educational Development (GED) Program provided the military with maximum support in coping with increased demands upon their educational facilities growing out of Project 100,000 and Project Transition. This was an integrated program for the general educational development of military personnel from basic literacy through high school equivalency. Since the Core-GED Program began in March 1968, USAFI received reports on a total of 30,563 students who had been enrolled in a total of 71,804 courses.

Since its beginning, over seven million course enrollments were processed by USAFI. Other services, too numerous to describe here, were performed by USAFI during its years of operation. Some of the more important included performing as language accreditation clearing house, processing achievement tests, computer controlled student services, computer assisted lesson service, and coordinating with the Amercian Council on Education relative to accreditation of service experience.

This is only a portion of the USAFI story because there is so much more the organization has done than is herein accounted for. Words to adequately tell the story would overflow the capacity of our magazine. But we could not permit the United States Armed Force Institute, supported all these years by its inspired and dedicated staff, to expire without saying, "magnificently done."

INFANTRY Magazine Available

We bring this announcement to the attention of our readers at the request of the Editor of INFANTRY Magazine.

Beginning with the January-February 1974 issue, INFANTRY Magazine has been approved for limited free distribution to Infantry and Infantry-oriented units.

Active, Reserve, and National Guard Infantry units, beginning at company level, are receiving three copies each. If your unit has a "need to know" and is not receiving INFANTRY as yet, please submit your request along with written justification to: Commandant, US Army Infantry School, ATTN: ATSH-I-V-M, Fort Benning, GA 31905.

Subscriptions ($5.95 for one year) will continue to be available to interested individuals by writing: INFANTRY Magazine, P. O. Box 2005, Fort Benning, GA 31905.

The Battle of Britain

The Battle of Britain is a paradox - it was a campaign, rather than a battle, and neither side won a clear-cut victory in that neither was defeated. One side, with superiority in numbers but with no strategic plan, had the capability of accomplishing its avowed purpose of destruction of the Royal Air Force. The defender, with a viable air defense system, its back against the wall after the decimation of its ground forces in France and at Dunkirk, and with the fate of England at stake, managed to prevent such action. From this standpoint, Britain won the Battle in its "finest hour." Evidence indicates that the Germans had victory in their grasp and then defaulted.

Germany paved the way for her ultimate defeat by abandonment, in the early 1930's, of the principle of strategic air operations. Although some heavy bombers were produced, medium bombers and fighter bombers were the backbone of her airpower. Fighters, particularly those of long range, were of secondary importance. Lack of appreciation of strategic thinking marked the German Air Force. It was trained, conditioned, and equipped — and bloodied successfully in battle — for tactical operations in support of the Army. Such operations were well-planned and executed, and the excellent results obtained relegated strategic thinking further to the background.

The British were in fairly bad straits when the Dunkirk episode closed. The RAF had lost 453 Hurricanes and Spitfires and 320 pilots, one-fourth of each during the valiant attempts against Luftwaffe efforts to block the evacuation. As a result, on the 5th of June, the Fighter Command had only 466 serviceable airplanes to repel an enemy who had four times that number, and only 331 of these were first-line Hurricanes and Spitfires. Only 1,100 pilots were available, and reserve aircraft immediately available totaled just 36. The tactics of Fighter Command were that planes must be husbanded, large fighter-to-fighter battles must be avoided to hold down losses, and fighters must concentrate on bombers. This tactic was to be the undoing of Goering.

The German use of radio beams for bomber guidance, on which work had begun in 1935, was discovered early in June 1940. This resulted in the establishment of No. 80 Wing, the beginning of England's electronic countermeasures organization which played a big part in air operations beginning in August and continuing throughout the war. (When the Knickebein radio homing was used in August, the Wing was able to block out the signals completely or, at times, bend the beams and insert a false signal so that bombs were dropped on open areas.)

The antiaircraft picture in England was not good. The AA Command had less than half of what was necessary, being short some 2,400 heavy guns, 3,800 light guns, and thousands of searchlights.

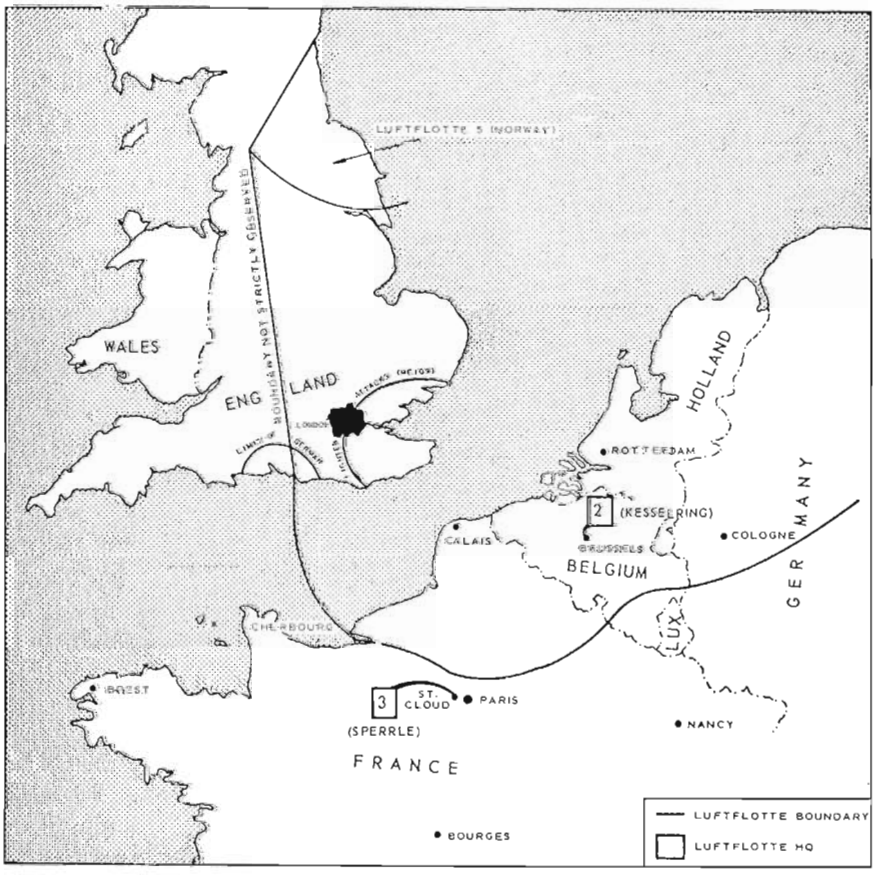
A German intelligence study, **Study Blau**, in July 1940, overestimated the number of fighters available to the RAF; just under 600 were available, not the 900 estimated. It underestimated the capability of the Spitfire and the strength of heavy antiaircraft, although correctly assuming that the latter was not adequate in numbers to provide full protection. The number of RAF pilots was greatly overestimated; actually, the RAF was sorely put to obtain enough pilots to maintain unit strengths for current and new squadrons and to replace combat losses. British fighter production was grossly underestimated at 180 to 300 planes per month; real production figures during the Battle from July through September were a total of 1,439, plus many more which came from a massive repair and rebuild program. During the Battle, German pilots complained that British planes kept appearing from nowhere even after they had been told that the RAF had been decimated. German intelligence failed completely to recognize the value of radar in the integrated system of air defense of Great Britain. Operations rooms, sector operations for the ground control of the air battle, communications, and the British grim determination to hold the line were treated lightly. After Dun-

kirk, Hitler still believed that England would come to terms. When she did not, he decided that the RAF must be eliminated and that an invasion of England might be necessary; in fact, plans for the invasion, Operation Sea Lion, were ordered in July 1940 for execution in August after air supremacy over England should be obtained. Attacks then were to be made against British industry and air force installations, with concurrent reconnaissance missions and raids to locate the British defenses. The RAF and the aircraft industry were to be attacked, followed by attacks on harbors and shipping. Gun-laying radars were in such short supply that individual batteries were not served by their own radar, nor could the predictors accept data from radars. The RAF radars were neither accurate enough nor deployed properly for direct support of antiaircraft units. Searchlights were used primarily for assistance to fighters operating at night, but British weather decreased their value for that purpose or for illumination for the gun units.

Phase One. The Air Ministry set the dates of this phase of the battle from 8 to 18 August, followed by reconnaissance and light raids until the 23rd. However, the first attack in what Germany called the war against England was not made until the 13th. Primary effort of the Germans was directed against shipping and Channel harbors and fighter airfields in the south and southeast of England. To counter the force of over 2,500 aircraft across the Channel, the Fighter Command by this time had about 1,100 fighters available or in immediate reserve; but, because of their deployment and the necessity of retraining a reserve, only 200-300 fighters could be used to meet the Germans. Early in the period, the Germans attacked radar stations, one of which was knocked out of action for some time; others received some damage, but remained in operation.

The 15th of August marked the critical point of phase one, as it saw the largest German effort to date, about 1,800 sorties, with the largest formation comprising about 150 airplanes. Some 150 came from Norway to attack airfields and radar; the remainder came from France with similar targets in mind. All attacks also sought to destroy RAF fighters, and the Germans put up almost every available fighter to do battle. Only 520 bomber sorties were flown, about one-half of the available bomber force.

Phase Two. The period from 24 August to 6 September marked a change in German tactics.



Sperrle and Kesselring divided the United Kingdom and planned on gaining air superiority in about 5 days. After one large raid from Norway, attacks from that direction were limited to reconnaissance.

superiority and invasion fleet losses had become prohibitive. Hitler now could turn to the Russian campaign, planned for May 1941, the Balkans, and North Africa.

The aircraft continued to struggle along, exacting a modest toll, splitting up formations, keeping the Luftwaffe at the higher altitudes, and indicating locations of aircraft to friendly fighters by bursts in the sky. Searchlights remained relatively ineffective due to the notorious English weather and the high altitude of aircraft. The lights were of considerable value to returning night bombers throughout the war by indicating locations of bomber bases.

It was in tribute to the Fighter Command pilots and their role in the Battle that Churchill made his historic announcement of owing so much to so few. But aircraft alone could not have countered the blows of the Luftwaffe. Inadequate as they might have been, the antiaircraft units helped to keep the Germans off balance. The integrated Air Defense of Great Britain, with its radar, observer corps, system of operations centers and communications, and inferior numbers of weapon systems, stood off an enemy who had victory in his grasp several times during the Battle.

Although antiaircraft accounted for less than 300 German aircraft, this is not an unimpressive figure, considering the type and inadequacy of material, the requirement to fire on seen targets only, (except in the Inner Artillery Zone on the nights when friendly airplanes were not allowed over London), and the withholding of fire at night when only one or two friendly fighters were trying unsuccessfully to find a lot of Germans. Excluding the barrages and the tremendous amount of resultant ineffective fire, antiaircraft ended the first year of war in August with an average of 350 rounds of heavy AA and 250 rounds of light AA **aimed** fire per plane killed. During July and August, the figures were 240 and 120. In the AA division which saw the most action, and hence had the most practice, the figures were down to 170 for heavy AA guns.

In the spring of 1941, antiaircraft was to account for one airplane kill to each two made by Fighter Command planes; radar and improved night firing techniques were to pay off. Including all the rounds expended in the barrages, some 30,000 rounds were fired per kill in September, 11,000 in October, and 4,087 by January 1941. This compares with the 6,000 rounds required in 1918 per kill. It was the antiaircraft which assured that, even if the bomber did get through, it did not always get home.

In retrospect, it appears that the Battle of Britain was the turning point of the air war. Never again was the Luftwaffe to have such a superiority of numbers and a golden opportunity to eliminate a strong opposing air force.

Air Defense Briefs

SAM D Firings

The Army recently conducted several controlled test vehicle (CTV) firings of its new SAM-D air defense missile at White Sands Missile Range, New Mexico. The SAM-D missile was paced through a series of severe attack maneuvers and all test objectives to date have been accomplished. This series of 10 test missile firings was to be completed by the end of July to verify the SAM-D onboard control system and the aero-dynamic design of the missile. The CTV tests are to be followed by a 16-missile engineering demonstration model firing phase, which is to be completed by October 1975, to demonstrate successful integration between the in-flight missile and the ground-based, phased array radar under a variety of intercept conditions.

Tactical Airspace Management

A general officer level conference on tactical airspace management was conducted earlier this year at the US Army Air Defense School (USAADS). Commander, TRADOC, chaired the conference and led the open discussions.

At the conference USAADS made a three-part presentation. Part I concerned the principles and equipment used by the US Air Force (USAF) in providing tactical air control. Part II was a proposal for solving in part the US Army's tactical air problem. Part III was a live demonstration of the proposal. In the presentation, USAADS recognized that continuous positive control of all airspace users was undesirable and unrealistic. The USAADS position supports bulk-management

techniques; i.e., the bulk or aggregate of activity should be managed by standing operating procedures and by functional control systems such as Army Air Defense Command and Control System, US Air Force Tactical Air Control System, Fire Support Coordination, and Air Traffic Management System. Any exception to the normal situation should be managed by an Airspace Service System. In support of the Airspace Service System, USAADS proposed that the division flight coordination center (FCC) operations be performed by air traffic control personnel collocated with the Army air defense command post (AADCP) of a Hawk battalion normally placed in direct support of a committed division.

In summing up the proposal, it was explained that ADA has communications links vital to the exchange of critical information needed in determining and resolving airspace conflicts, and that, through collocation of the Hawk AADCP and FCC, another information link to Army aircraft is gained. Finally, USAADS pointed out that its proposal would provide: immediate improvements in ADA and Army aviation coordination, better early warning of aircraft attack to division forces, ADA Hawk radar support of FCC operations, and a more efficient interface between the division tactical operations center (DTOC) and USAF operations.

Fire Power Demonstration

The 3rd Battalion Airborne (Vulcan), 4th Air Defense Artillery, 82nd Airborne Division (the Army's only airborne air defense artillery battalion), recently sponsored a fire power demonstration at Fort Bragg.

LTG Richard J. Seitz, XVIII Corps Commander, MG Frederick J. Kroesen, Commanding General, 82nd Airborne Division, BG Volney F. Warner and BG Joseph L. Fant, Assistant Division Commanders, witnessed the demonstration which was open to the public. Redeye was fired at ballistic aerial target systems by two Redeye gunners, both scoring hits. A CF-47 Chinook helicopter was used to airlift a Vulcan system into the demonstration area. The weapon became operational within a few minutes after it was set down. Static displays of the forward area alerting radar, a Redeye team, and an M561 Gama Goat with a Vulcan air defense system were available for spectators to observe.

A spectator observes as a soldier from the 3rd Battalion Airborne (Vulcan), 4th Air Defense Artillery, explains the functions of the Redeye during a fire power demonstration.

A preliminary contract has been let to begin production of the Improved Hawk air defense system for six North Atlantic Treaty Organization (NATO) nations. It is anticipated that this will be a $660 million program. Approximately 60 percent of the work will be performed by the US and 40 percent by European companies. NATO nations participating are Denmark, Federal Republic of Germany, France, Greece, Italy, and the Netherlands.

The program, according to the NATO Hawk Organization, will allow participating countries to bring their Hawk weapon systems up to the same level of capability as that of the US Hawk forces in Europe, in accordance with the recommendation of the Supreme Allied Commander, and to contribute more effectively to the air defense of Europe.

The Improved Hawk system employs advances in electronic technology and is a more reliable air defense sytem than its predecessor, Basic Hawk. Improved Hawk missiles contain a new guidance package, larger warhead, and improved motor propellant. In field use, no maintenance is required because missiles go directly from production lines to launchers as certified rounds. Ground support equipment has also been updated with portions automated. A new electronic data processor, for example, will assist in target engagement functions. For easy maintenance, the new equipment features built-in troubleshooting capabilities.

Improved Hawk to Saudi Arabia

The item, "FAAR" Improvements," on page 52 of the June issue of "Trends," stated that Sanders Associates had been granted a contract to effect improvements in the forward area alerting radar to meet foreign market requirements. The assertion that Sanders Associates is under contract is incorrect. Sanders is using internal R&D and corporate funds to develop an advanced FAAR system.

Motor Officer Course

The Commandant, US Armor School, recently emphasized to other school commandants the value of sending company grade officers to the Motor Officer Course (8C-0600) conducted at the Armor School. The course should be particularly beneficial to officers assigned to Chaparral/Vulcan and other high density vehicle units. The course is 8 weeks in length. ADA Branch will be publicizing the course and intends to send an increased number of officers TDY enroute to their next assignment. Additionally, commanders are encouraged to seek quotas from their major commands to send officers TDY to the course. Watch for further information in future issues of **Air Defense Trends** and the **Air Defense Bulletin** regarding this course.

Redeye Recommeded for Chaparral TOE

USAADS recently completed a study addressing the addition of Redeye teams to the Chaparral battery TOE. The study was conducted by an ad hoc committee which recommended the Chaparral platoon TOE be changed to authorize a basic load of weapons, radio equipment, and other items required to support the Redeye capability. It further recommended that the weapons be manned on an "as needed, additional duty" basis, and certain platoon personnel by Redeye qualified (awarded ASI R6, Redeye Operations).

U.S.-Spanish Team to Modernize Air Defense of Spain

Combat Grande, a project to modernize the air defenses of Spain, will be conducted by a team of United States and Spanish industrial firms under a $31.2-million program.

COMCO Electronics Corporation, jointly owned by Hughes Aircraft Company and Compania de Electronica y Communicaciones, S.A. (CECSA), of Spain, has been chosen to develop the new system under contract from the US Air Force's Electronic Systems Division, Hanscom Field, Mass. The teaming arrangement gives Spanish industry the opportunity to participate directly in the develop-

ment and management of a major electronic system while providing for the transfer of modern technology to Spanish industry.

Hughes will produce the computers and other critical equipment for Combat Grande, and will design the communications equipment and provide the technical manpower under subcontracts from COMCO. Under similar subcontracts, CECSA, at its Madrid and Barcelona facilities, will manufacture the communications subsystems and will manage the civil engineering construction for the program.

The new program is designed to automate Spain's manual air defense system by providing a computerized capability for aircraft surveillance and tracking. It concludes the development of a combat operations center, and a sector operations center, and modernization of seven long-range radar and ground-to-air transmitter radio sites located throughout the Spanish peninsula. The program also calls for the improvement and enlargement of an existing microwave system to tie into the new defense system. The Spanish system will employ the Hughes H5118M computer, the company's latest development in its line of militarized air defense computers.

RADEX, developed in an earlier air defense ground environment (ADGE) program, will be the video extractor, providing the latest in radar signal processing technology. RADEX also was procured recently by the Air Force for integration into its 407L system.

COMCO will retain responsibility for program management, systems engineering, computer software, and logistical support. COMCO also will install the system in Spain and conduct acceptance testing.

Other ADGE systems developed by Hughes include BADGE, in Japan; FLORIDA, in Switzerland; and NADGE, NATO's air defense system.

Military Personnel Notes

Project Manager Development

The Military Personnel Center (MILPERCEN) Officer Personnel Directorate has established a revised Project Manager Development Program to insure that qualified officers are identified, selected, and trained to support future Army requirements for project managers. A Special Project Manager Development Office will manage the program and monitor the professional development plan for officers who desire to pursue interspecialty project management development and assignments. It is being organized as a subordinate element of the Officer Personnel Directorate's Office of the Deputy for Professional Development and Plans.

The development goal is to qualify officers who will eventually exercise centralized management over the planning, direction, control of research, development, initial procurement, production, distribution, and logistical support for future designated equipment or weapon systems.

New DA Pamphlet 600-3 (Officer Professional Development and Utilization) contains a separate chapter on project manager development. The chapter addresses interspecialty professional development and future service in project manager and supporting positions. Application procedures for those officers interested in pursuing interspecialty development and future service in these highly important positions are outlined in paragraph 30-4(a) and (b) of the new pamphlet.

Oversea Reporting

Personnel receiving orders for oversea assignments must arrive at the gaining oversea command during the arrival month specified in assignment instructions issued by MILPERCEN. Commanding officers are responsible for insuring that individuals are POR processed and have port call dates in time to arrive at the gaining oversea command as specified. Local adjustments of the arrival month without prior MILPERCEN approval are not authorized. Except for extreme emergencies, request for deletion or deferment from assignments must be submitted in accordance with chapter 7, AR 614-200, and must reach MILPERCEN within 5 days after military personnel offices receive the individual's assignment instructions. Timely submission will expedite a decision and in the event of approval, accommodate actions necessary to assign suitable replacements. Requests for deletion or deferment based on extreme family problems should be addressed to CDR MILPERCEN, ATTN: DAPC-EPA-C, 2461 Eisenhower Avenue, Alexandria, VA 22331. Requests for all other reasons should be addressed ATTN: DAPC-EPC-A. Additional details are con-

tained in DA Message, DAPC-EPP-P 071705Z Feb 74.

Automated Personnel Information

The old manual Officer Qualifications Record (DA Form 66), maintained by the officer career branches, has been replaced by a new computer-prepared and maintained Officer Record Brief (ORB). DA Selection Boards have found the ORB to be a highly useful and more accurate document in support of the selection process. In the field, SIDPERS (Standard Installation/Division Personnel System) is being implemented rapidly throughout the Army. With it comes a new two-part field personnel record, one part of which is computer prepared and maintained. At the Army's Military Personnel Center, an improved computer facility is being installed to give DA personnel managers even more responsive automatic data processing equipment. Personnel managers at DA already have, via remote computer terminals, the capability to query personnel data banks. Hundreds of computer-prepared reports are used as essential elements of the decision-making process for individual career management, as well as personnel planning and policy making.

Civilian Education

Military personnel entering a civilian institution under full-time Army education programs are required to continue enrollment on an uninterrupted basis — to include summer sessions where applicable — and must pursue maximum academic workloads approved by the educational institution. Personnel who were participating in these programs effective 1 June 1974 are required to adjust their academic programs to take the following academic workloads:

(Academic Degree System	Academic hours per training period)	Minimum Workload Being Pursued
(a) Graduate degree (b) Undergraduate degree	Semester System	(a) 12 hrs/semester (b) 15 hrs/semester
(a) Graduate degree (b) Undergraduate	Quarter System (Include Summer Quarter)	(a) 12 hrs/semester (b) 15 hrs/semester
All degrees	Total Summer Period (for schools on semester system)	12 hrs if the school has two sessions during the summer period (6 hrs each session); 9 hrs if the school has a single session (term) during the summer period.

Students are reminded that prior approval from their officer or enlisted career branch is required if it is anticipated that they will not be able to complete the designated minimum workload per academic training period. Approval is also required in those cases where a particular school policy recommends undertaking a workload less than the minimums indicated above. The policy will not apply to personnel who are in their last semester (quarter) and require less than the minimum workload to complete degree requirements.

ODCSPER Service Discontinued

Services previously performed by the Office of the Deputy Chief of Staff for Personnel (ODCSPER) Assistance Center — established in early 1972 as a point of contact for coordinating and expediting information on new or changed personnel policies directly with the field — have been recently assumed by MILPERCEN. Effective immediately, the following Autovon numbers are operational at MILPERCEN Headquarters:

221-0508 for problems related to personnel support services at the installation military personnel office and all unit personnel offices down to company level.

221-7792 for enlisted personnel matters.

221-0694 for officer personnel matters.

Enlisted Efficiency Reports

Due to a printing error, approximately 500,000 DA Forms 2166-4, Enlisted Efficiency Report, have been printed without the corresponding numbers above the mark sense blocks in the form's Part II C, "Advancement Potential." Personnel officers are reminded to enter the appropriate numeric codes above each block before sending the EER forms to raters for completion. Raters should be certain their evaluation in the blocks matches the Rater Verification (RV) box and, before the personnel officers forward the completed reports to the Enlisted Evaluation Center, they are required to verify the raters's "RV" coding to make sure it is correct.

Company Level Personnel Guide

A new Company Level Personnel Guide is being developed. The Guide will combine present personnel procedures, automated and manual, into a single reference volume for use at the company level. The Guide will ultimately consolidate all company level requirements concerning personnel management and administration matters that are contained in DA Pamphlet 600-8 (Military Personnel Office Management and Administrative Procedures) and SIDPERS User Manual, Volume 1 (Unit Level). All known requirements contained in other HQDA directives related to company level

administration, training, supply, mess, and maintenance of supplies and equipment will be incorporated.

Prodecures in the Guide will stand alone to the maximum extent possible with extensive use of decision logic tables, notes, examples, and minimal cross-referencing to other publications. The content in the procedures will include sufficient detail in easy-to-understand language.

The new Guide will also establish responsibilities and functions in the field of personnel management and administration for unit commanders, first sergeants, unit clerks, and personnel staff noncommissioned officers. Moreover, the Guide will facilitate standardization of company level procedures, simplify the training requirements for unit clerks throughout the Army, and assist the unit commanders by defining their responsibilities and interface with the servicing military personnel office.

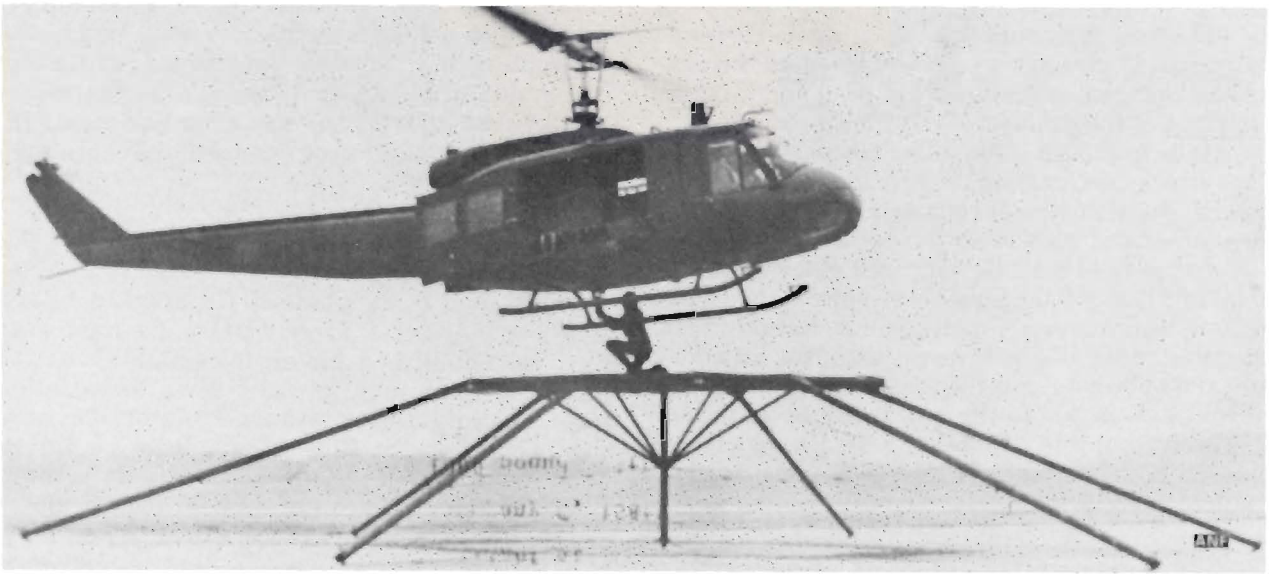
Current plans call for publication of this new guide around March 1975 after coordination with field elements.

Air Defense Artillery Turnaround Time

Following is an updated listing of standard turnaround times for the different enlisted career management files. An effort has been made to mix assignments in long-to-short and short-to-long sequence.

MOS	Grade	Months	MOS	Grade	Months
16B	1-5	12	24B	All	12
16B	6-7	20	24C	All	12
16C	1-5	12	24D	All	12
16C	6-7	20	24E	All	12
15D	1-5	12	24F	All	12
16D	6-7	20	24G	All	12
16E	1-6	12	24H	All	12
16H	All	16	24J	All	12
16J	All	24	24K	All	12
16K	All	24	24M	All	24
16P	All	12	24N	All	18
16R	All	12	24P	All	20
16Z	8	16	24Q	All	36
16Z	9	50	24U	All	12
22G	All	18	24V	All	12
22K	All	24	25G	All	36
22L	All	18	25H	All	24
22M	All	18	25Z	All	36
23N	All	24	27B	All	12
23Q	All	24	27E	All	12
23S	All	24	27F	All	24
23T	All	24	27G	All	12
23U	All	12	27H	All	12
23V	All	12	27Z	All	24
23W	All	36	46D	All	24
			OOG	All	24

Postscripts



This helicopter tree-landing platform is designed to be placed on the tops of trees to provide a heliport where landings would otherwise be impossible.

The all aluminum device weighs 1,000 pounds complete with hoist, radios, and generator.

Aerobee in Space Role

NASA scientists are considering using an Aerobee rocket program to fill the flight gap between the last manned Skylab experiments and the first space shuttle experiments. The space sounding rockets would support Skylab experiments, with emphasis on processing materials. The Aerobees would provide 300 seconds of weightlessness compared to the 6-9 seconds attainable on KC-135 zero-g trajectory flights or 3 seconds n NASA's drop tower.

Brazo Missile

Action is underway to provide the Navy and Air Force with a new air-to-air missile. The missile, called Brazo, is undergoing aviation electronics evaluation at Litton Industries' Amecom Division. Brazo's value lies in a radar homing capability and the current study involves a sorting technique whereby the missile may acquire and home on an enemy airborne radar.

SCOPES

SCOPES or Squad Combat Operations Exercise (Simulation) is a new training concept initially designed by the Army Research Institute in Washington, D.C. This new training technique has been tested by the Combat Arms Training Board and the US Army Infantry School at Fort Benning, Georgia.

Here is how the system works. A six-power telescope is mounted on each man's M16 rifle; each

The soldier in this scope sight will be designated a casualty during combat training because the number on his helmet has been identified by the soldier aiming at him.

squad member has a number pinned on the four sides of his helmet. As the attacking squad nears its objective, the defending unit attempts, by means of the scopes, to read the numbers on the helmets of the advancing troops. Controllers with radios accompany both the attacking and defending units. If a trooper's number is sighted the controller designates him as a casualty and he must drop out of the problem. The officer in charge records the numbers of the fallen troopers and, after the attack is complete, supervises a critique at which soldiers are encouraged to suggest improvements to each other's movements.

Because field tests have proved so successful, a total of 3,000 SCOPES sets (six-power scope, rifle mount, and numbered patches) has already been distributed. In the next several months an additional 30,000 sets are scheduled to be in the hands of troops. Reaction to the new training technique has been favorable. The SCOPES training has increased both morale and interest in basic squad tactical exercises.

New Container Lift

A specially equipped Army CH-54 helicopter recently picked up a 20-foot Mil-Van container, transported it, set it down, and released it — all without ground crew assistance. This is believed to

be the first time this feat has been accomplished with a helicopter, according to the US Army Air Mobility Research and Development Laboratory (AMRDL). It was done through the use of a container top lift device, developed and built by the Boeing-Vertol Company under a contract with AMRDL. The device is designed to transport 8-foot by 8-foot by 20-foot commercial shipping containers, weighing up to 57,000 pounds, with the CH-47, CH-54, and the planned Heavy Lift Helicopter. Special features of the device enable it to pick up containers directly from cells of a container ship, off a tractor-trailer unit, from a stacked position on the ground, or off a loading dock. The device assures increased safety since no ground personnel are needed during hook-up or release. Increased productivity will also result from the device's quick hook-up and release features. An operator controls the container top lift device with a fully-automatic control box in the helicopter. He commands the various positions of the guide arms which place the device in the proper position over the container and rotate the latches for acquisition or release of the container.

Monographs Available

The first 5 of 22 planned Department of the Army monographs covering the Vietnam War have been published and made available to active duty and reserve troop units down to battalion level. The volumes are also available for sale to the public through the Government Printing Office, Washington, D.C. Known as the "Vietnam Studies," the volumes are interim historical accounts by senior Army officers drawing on their experiences in a variety of Vietnam assignments. The topics published to date are: "Communications-Electronics," by MG Thomas M. Rienzi; "Base Development;" by LTG Carroll H. Dunn; "Riverine Operations" by MG William B. Fulton; "Special Forces," by COL Francis J. Kelly; "Medical Support," by MG Spurgeon H. Neel, Jr.; and a volume on "Airmobility" by LTG John J. Tolson, III. Other planned topics include: Operation Cedar Falls-Junction City, Intelligence, Allied Participation, Engineers in Vietnam, Defeat of the TET Offensive, Command and Control, US Army's Role in Pacification, Training and Build Up of ARVN, The War in the Northern Provinces, Tactical and Material Innovations in Vietnam, Logistical Support, Sharpening the Combat Edge, Financial Management, The Judge Advocate General in Vietnam, Armor, and Artillery.

Military History Available

If you want some background on the military's role in developing the United States, the place to contact is the Army Military History Research Collection. The collection, located at Carlisle Barracks, has the most extensive accumulation of published and unpublished material on that subject in the world. In addition to more than 120,000 bound volumes, there are numerous diaries, letters, photographs, and personal records that can give a researcher an intimate insight into past events. Efforts are now underway to compile an oral history of tape-recorded interviews.

Speaking of Streaking

The US Army's wire-guided TOW antitank missile streaks from an AH-1Q Huey Cobra attack helicopter during tests at the Yuma Proving Ground in Arizona of the first gyro-stabilized sight system developed for the Huey Cobra. It is the first of nine sight systems being built by Hughes Aircraft Company for Textron's Bell Helicopter Company. During accuracy firings conducted by Bell, employing a variety of ranges, helicopter speeds, and maneuvers, the percentage of TOW missiles scoring hits on stationary and moving targets exceeded established requirements.

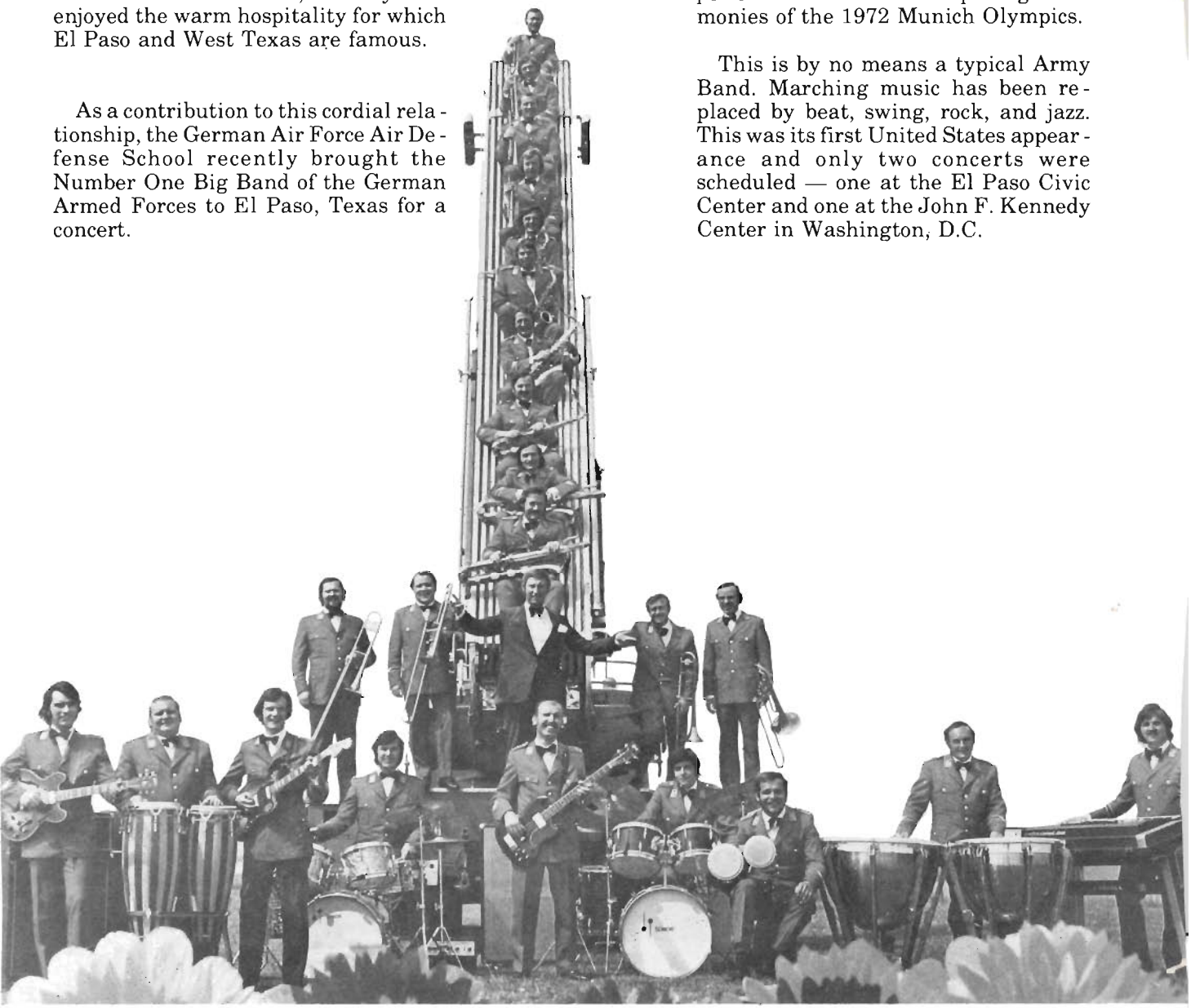
Top German Military Band

In 1966, the German Air Force Air Defense School was established at Fort Bliss. Since then, almost a thousand German military dependents have made El Paso their home, and they have enjoyed the warm hospitality for which El Paso and West Texas are famous.

As a contribution to this cordial relationship, the German Air Force Air Defense School recently brought the Number One Big Band of the German Armed Forces to El Paso, Texas for a concert.

The band is made up of selected Performers from all German Armed Forces Bands and has been specially trained for public performances. Its first public performance was at the opening ceremonies of the 1972 Munich Olympics.

This is by no means a typical Army Band. Marching music has been replaced by beat, swing, rock, and jazz. This was its first United States appearance and only two concerts were scheduled — one at the El Paso Civic Center and one at the John F. Kennedy Center in Washington, D.C.



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