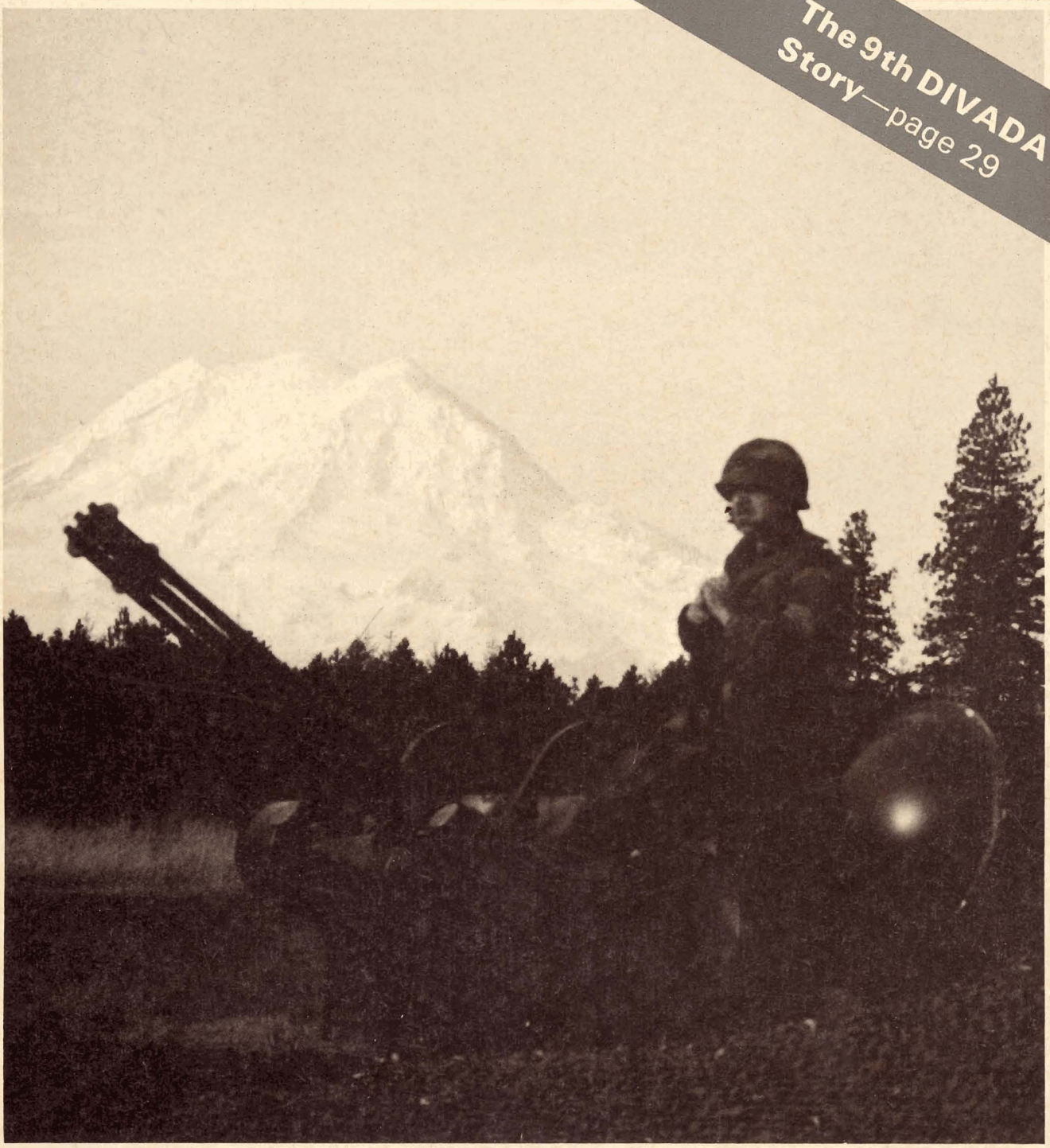
AIR DEFENSE ARTILLERY



The 9th DIVADA Story—page 29

SPRING 1984

AIR DEFENSE ARTILLERY

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About the Cover

Majestic Mount Rainier towers in the background as a 9th Infantry Division Air Defense Artillery gunner mans a towed Vulcan. *Air Defense Artillery* is indebted to MAJ Robert Curran, 9th DIVADA's air battle management officer, who served as project officer for the 9th DIVADA section in this issue of the magazine.

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ADA Bulletin Suspended

Publication of *Air Defense Artillery Bulletin* has been suspended, pending a final decision on a Department of the Army Periodical Review Board's recommendation that the bulletin be terminated. Until further notice, information previously published in the bulletin will be disseminated through other channels to Air Defense Artillery units only on an "as needed" basis.

AIR DEFENSE ARTILLERY

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INTERCEPT POINT

Air Defense Artillery is well on its way toward becoming a "Branch of Excellence" within an "Army of Excellence," but self-congratulations remain premature. Air defense artillery units engaged on the mock but highly realistic battlefield of the National Training Center continue to show symptoms of a lack of expertise at air-land battlefield doctrine and tactics.

AirLand Battle Doctrine is not a futuristic concept to be placed on the shelf until all new weapon systems are fielded. We must practice to become expert at fighting the air-land battle now.

Air defense artillery units are making headway in their battle against the 32nd Guards Motorized Rifle Regiment, the National Training Center opposing force, which has established an enviable record by trouncing most of the friendly units sent up against it on the desert ranges of Fort Irwin, Calif. This progress is reflected in air defense artillery extracts from after-action reports compiled during the past quarter's National Training Center rotations.

The U.S. Army Air Defense Artillery School recently mailed six sets of these extracts to air defense artillery brigades and battalions to help units correct training deficiencies revealed at the National Training Center. The after-action reports contain numerous examples of effective air defense artillery employment:

Reported Event: Initial air defense coverage of the task force was effective.

Effect: The task force's capability to bring its combat power to bear against the opposing force was increased through effective protection of the force from air attack.

Reason:

(1) Air defense artillery was well integrated into the task force organization.

(2) Air defense weapons maintained good dispersion and camouflage in the assembly area.

(3) The Vulcan platoon's movement with Team B was well coordinated.

(4) Air defense artillery and small arms successfully engaged enemy aircraft.

Major General James P. Maloney

The after-action reports, however, contain an equal number of instances in which air defense artillery units failed to accomplish their mission of providing protection for the maneuver force. The following are but a few examples:

- The task force did not establish air defense protection priorities.
- The Vulcans engaged beyond their maximum range.
- The Redeye gunners were given no ammunition.
- The air defense officer did not know the status of the Chaparral platoon and could not adjust his coverage to support the task force.

The reported failures were often due to basic errors in planning and execution and a lack of familiarity with air-land battlefield doctrine and tactics. Luckily, air defense artillery units committed these errors on a battlefield where casualties rise to fight another day. We cannot eliminate basic errors in air-land battle tactics unless each air defense artillery soldier understands the importance of the role he or she plays in the transformation of the force into an "Army of Excellence."

Air Defense Artillery, the high-technology branch of the combat arms, is, and always has been, at the vanguard of change. Today, the branch is out in front of the Army's transition to the "Army of Excellence" and AirLand Battle Doctrine. Doctrinal recognition of the multidimensional battlefield is not new to Air Defense Artillery. In a sense, we have always been fighting an air-land battle. Our weapons and our mission dictate a focus on the third dimension of the battlefield as we provide protection for the maneuver units we support. The integration of conventional, electronic, chemical and nuclear warfare into a cohesive, composite picture which reflects the realistic capabilities of modern forces is a natural extension of air defense artillery thinking.

In a message to the air defense artillery community contained in this issue of *Air Defense Artillery,* MG Robert W. RisCassi, commander of the 9th Infantry (Motorized) Division, applauds the "extraordinary progress" of the soldiers of the 9th Division Air Defense Artillery at Fort Lewis, Wash., who have adapted air defense weapons and tactics to the requirements of light divisions. During a recent functional area analysis in Washington, D.C., the air defense artillery team set new standards of excellence for other branches.

Air Defense Artillery's new weapon programs are in good shape, despite a recent six-month delay in SGT York Gun production. As Patriot is fielded to the Active Army, the Guard will acquire at least two Hawk battalions; as the SGT York Gun is fielded, the Guard will acquire product-improved Vulcans. The 1st Battalion, 200th Air Defense Artillery, at Roswell, N.M., will be the first National Guard Chaparral battalion.

It is an exciting time to be a member of Air Defense Artillery, but we must remember AirLand Battle Doctrine emphasizes the human element of combat. It demands well-trained soldiers and skillful, effective leaders. The individual soldier at the fire unit level can do little to speed the creation of new organizational structures or the production of new weapon systems, though each has input into the system. But the individual soldier can—and must—play his or her part in making Air Defense Artillery a "Branch of Excellence" by becoming expert at the basics of the air-land battle. ✶

ON TRACK

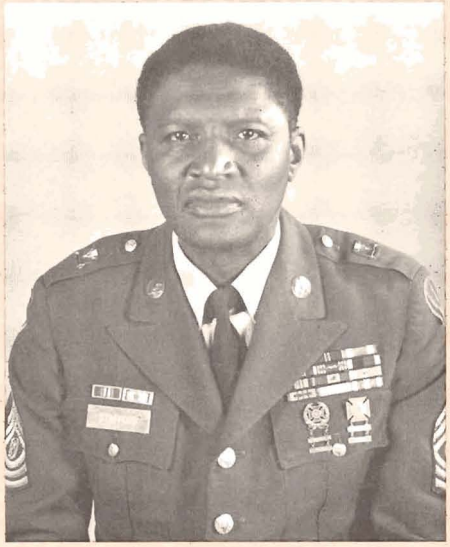
In January, Secretary of the Army John O. Marsh Jr. and GEN John A. Wickham, chief of staff of the Army, announced that 1984 would be the year of "The Army Family." We are almost midway through the calendar year now and I am still encountering enlisted personnel, many of them senior NCOs, who are unaware of the emphasis the Army has placed on this most important subject.

In the Army, one might think of "family" as the two sides of a coin. On the military side, it is the team, the battery, the battalion, the brigade, the branch and the service. It is all of us pulling together in unison to accomplish the Army's missions and goals. It is team spirit and camaraderie.

On the other side, the family is the wife or husband, children and, if you're an old warhorse like me, grandchildren. It is that aspect of the family that I want to stress among our enlisted personnel. Most of the senior NCOs today will remember the once popular witticism in military circles, "If the Army wanted you to have a family it would have issued you one." During the past few years that deprecatory attitude toward family life has changed dramatically and will continue to change. As emphasized by our top leaders, the Army is becoming more family oriented. We are recognizing, with increasing awareness, the impact the family has on our military and vice versa. For instance, we know that a contented family life engenders stability and harmony on the job. The opposite is true when a soldier's family life is thrown into a state of upheaval.

From the soldier's standpoint, his work experiences lead to stressful situations that inadvertently affect his home life. During a typical day, he may experience rivalry, increased responsibility, conflict and ambiguity, all of which will have some negative impact on him.

While talking with the wives of some of our junior enlisted soldiers, I discovered many of their concerns are common to dependents throughout the Army. Housing conditions could be improved. They would like to receive more help in moving. A sponsor program should be established for all enlisted personnel.



CSM Frederick T. Stafford Jr.

There were positive comments as well. Generally, the wives liked the security the Army offered them. Among the benefits, they cited regular pay, commissary and PX privileges and medical care. The overall friendliness of the military community ranked high in their responses. Wives who had been associated with the Army for more than five years felt that the Army was recognizing the family more than before, whereas those new to the community felt that the Army should be doing more for families. Well, the Army *is* doing more.

A major Army objective this year will be to examine the problems faced by our soldiers and their families and to find solutions to them. The Department of the Army has drawn up a list, based on views similar to those expressed by the wives with whom I spoke, for inclusion in the Army Family Action Plan. Some of the topics include relocation, family support and role identity, education and medical care.

While on the surface it may appear that Army families, in general, have been somewhat maligned in the past, that is certainly not the case. It's true that many of the complaints received are legitimate; however, there are just as many complaints voiced out of ignorance of what is, in fact, available to those families. So the Department of the Army's approach will be two-fold: first, to establish, correct or improve family programs; second, to make families aware of those programs that already exist for them. For example, there were a number of complaints that oversea schools were of a lesser quality than that provided by public school systems in the United States. The Department of the Army will publicize the results of independent study findings that reflect higher test scores for oversea students.

Those are some of the things the topmost echelon of the Army is doing on the grand scale. But they aren't enough. If the year of "The Army Family" is to be a success, our noncommissioned officers must contribute to the effort as well.

Remember, part of your responsibility as an NCO and leader is to care for and look after your soldiers, which in itself requires a great deal of sensitivity. Don't wait for someone else to start the ball rolling. That's why some things never get done. Take the initiative. Take control. Be a leader. If you don't have a sponsorship program for *all* enlisted personnel in your unit, start one! Newcomers' briefings for families, especially in oversea areas, can remove a terrific burden for dependents arriving in a strange land.

Orientations for incoming enlisted personnel can serve many purposes. On the one hand, they can be used to make dependents aware of what is available to them on the post. On the other, they can be used as a vehicle to draw the dependents into the unit family so that they, too, have a sense of belonging to the battery, battalion and brigade. To that end, you might also consider including families in unit parties, if you haven't already done so.

Many of our air defense artillery units, like the 5th Battalion, 52nd Air Defense Artillery, at Fort Stewart, Ga., have already initiated programs for their soldiers' dependents. Other units, like the 11th Air Defense Artillery Brigade at Fort Bliss, Texas, are following suit with similar programs of their own.

These are only a handful of suggestions. As I said before, it's up to you. Be sensitive to the needs of your soldiers and their families and show them that you care about their welfare. In that way, you will be doing your part in a big way to ensure that each year is the year of "The Army Family." ✱

Letters to the Editor

Philippine Campaign

I read MAJ Kirkpatrick's article "Echoes Of A Distant Battle" (Winter 1984) with great interest. He makes a valid point in stating that a study of the Philippine Defense Campaign means more to today's Army than does the European campaign of 1944-45.

The Philippine campaign of 1941-42 has to be the greatest defeat ever suffered by the United States. It, however, has never received any major historical study. For every book or article written on the Philippines, at least 100 have been written on Pearl Harbor. The "strike-out-of-the-blue" Pearl Harbor attack has governed much of the U.S. tactical and strategic thought since 1941, yet the Philippine campaign has even greater relevance to today's threat of war in Europe. At the heart of Europe's defense is the theory that advanced information on possible Soviet aggressive actions will be available from many sources, and that NATO will react to these with preplanned political and military actions. This is a great theory but look at the Philippines in 1941.

Although the United States has spent much time and energy studying the tactical and strategic actions on Europe's eastern front during World War II to understand better how to engage the Soviets in battle, the Army, in my opinion, would be in an even better position to fight in Europe if it would learn why the Philippine Defense Campaign was such a fiasco. The courage and dedication of the front-line troops are meaningless without timely direction and support.

It is time to seriously study the Philippine Campaign. If we do not understand the mistakes of that campaign, we will lose any campaign against the Soviets in Europe.

Charles H. Bogart
Office of the Adjutant General
Frankfort, Ky.

SA-5 Controversy Continues

I read CPT S.R. Gourley's article in the most recent issue of *Air Defense Artillery* with some interest ("Shifting The Middle East Air Defense Balance," Winter 1984). As he indicates, there has been a good deal of confusion over the SA-5 missile. However, I suspect that he may have been trapped by the frequent misidentification of the Griffon missile as the SA-5 Gammon. The photo in the article and the illustration both show the Griffon missile, not the SA-5 Gammon. As far as I know, no unclassifed photo of the SA-5 Gammon has ever been released. To my knowledge, the only unclassified imagery of it is a small illustration that appeared in last year's edition of *Soviet Military Power,* released by the Office of the Secretary of Defense. It was my impression that the Griffon, as shown in the article, was an unsuccessful rival to the Gammon, but for security reasons, the Gammon was deployed but not paraded, while the Griffon was paraded but not deployed.

Steven Zaloga
Greenwich, Conn.

Requesting Equal Time

The "Hotshots" of the 2nd Battalion, 59th Air Defense Artillery, lift our glasses in toast to our brothers in arms of the 3rd Battalion, 61st Air Defense Artillery, for a most welcome opportunity for a reply. Their article in the November 1983 issue of *Air Defense Artillery Bulletin* was certainly stimulating. But we, the soldiers of the First Tank, feel compelled to set the record straight.

It is true that the 3/61 ADA achieved an exemplary score of 100 percent during the ballistic aerial target simulator engagements at Crete, Greece, direct and tactical hits combined. After all, that's the business! The Chaparral and Redeye missiles are indeed weapons of consistency and accuracy. We respectively submit, however, that the 3/61 ADA was not the only unit to achieve such expected success—so have the 3/67 ADA and the 2/59 ADA, and perhaps some or even all of the 32d AADCOM battalions. It is not unusual to kill 100 percent.

All SHORAD skills are tested at Crete by a joint USAREUR team of evaluators. The unfortunate thing is that USAREUR has never seen fit to record all evaluation results so that those desiring comparison can do so.

We, the "Hotshots," would have been content to let the world go by, satisfied with our own accomplishments which are: 23 of 24 Chaparral squads above 90 percent; the top 12 squads above 97.69 percent; one Chaparral squad with a perfect 100 percent evaluation (first time ever: SSG Williams); 16 Redeye teams (our Stingers had to retrain for Redeye in the last weeks) achieved a 96.79 percent average with 100 percent kills as well. We don't take credit for corps Redeye—they did well, but we didn't train them. Our record stands as the highest in "recorded" NAMFI history. Recorded history is weak. We were only able to compare with the 1983 records; all else was in the memory of those NCOs who had been there many years.

There is no question that the 3/61 ADA was "Best in USAREUR ASP" with 100 percent hits—but lots of us were. However, the true and irrefutable ticket goes to the "Hotshots" of the 2/59 ADA.

Robert B. Clarke
MAJ(P), ADA
2nd Bn, 59th ADA

We welcome this correction of the record. Any more takers?

CORRECTION

Because of a printing error, seven lines were blocked out of the "Training For The NCO" article in the Winter 1984 issue of *Air Defense Artillery.*

The last line of column 2, page 43, should read:

The differences between them are that the BNCOC is only available to soldiers in combat MOSs, while the BTC is available to soldiers holding combat support and combat service support MOSs. The BNCOC is taught in NCO academies worldwide and the BTC is taught at the service school only.

Scale Model MiGs Provide Third Dimensional Training

by Robert Chalmers

Sub-scale, remote-controlled MiGs soaring above the desert ranges of Fort Irwin, Calif., are evidence of Air Defense Artillery's success in convincing members of the combined arms team that the air threat and air defense units must be fully incorporated into National Training Center (NTC) scenarios. The newly developed scale models of the MiG-27 Flogger-D provide realistic combined arms training for air defense artillerymen at the NTC. They are the results of a search for an inexpensive but effective aerial target and a logical extension of the drive to match training technology with advances in friendly and threat weapon technology.

During the conceptual stages of the NTC, the U.S. Army Air Defense Artillery School recognized the importance of incorporating air defense artillery units and a realistic air threat into NTC training scenarios. The type of aerial targets needed would have to effectively train personnel to engage fast-moving aircraft and allow air defense weapons to demonstrate their capabilities and effectiveness. Some of the basic requirements for such aerial targets were realistic maneuvers, flight characteristics and exposure times. These parameters would allow air defense personnel to train using combat tasks and skills rather than artificial training tasks. Properly employed, the aerial targets would allow weapons to maintain a probability of hits comparable to their actual combat capability.

The Air Defense Artillery School's Targets and Training Branch (recently renamed the Ranges and Targets Branch) of the Directorate of Training and Doctrine experimented with several options. Aerial targets already in the Army inventory were considered. These included the 1/9-scale, radio-controlled, miniature aerial target (RCMAT), the ballistic aerial target system and the standard Army MQM-107 target drone. Only the 1/9-scale RCMAT was approved for testing in validation exercises and the target was flown in a February 1981 company-level validation exercise at the NTC with limited success.

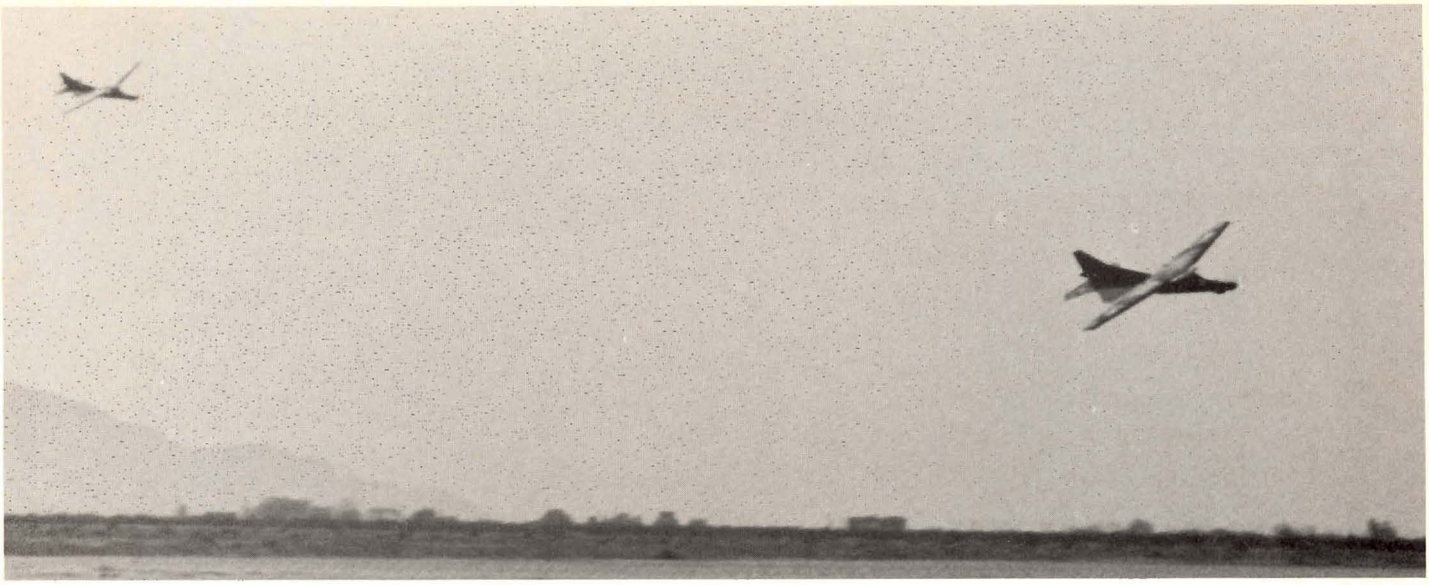
The small size and instability of the target demanded modifications. These modifications, engineered by the manufacturer, RS Systems of Beltsville, Md., included an increase in size and the addition of a functional stabilizer. The modified target was named the hostile expendable aerial target (HEAT). The first tests of the 1/7-scale replica of the Soviet MiG-27 were conducted during an August 1981 battalion-level, range validation exercise. The target met NTC requirements and was accepted for use in upcoming live-fire exercises.

Fort Bliss personnel provided aerial target service support through November 1981. RS Systems was awarded the service contract for January through September 1982. During the next nine months, the HEAT concept and hardware proved highly reliable and flexible enough for use in the free-play, fluid, live-fire exercises of the NTC. It also met safety and realism requirements and fell within budgetary constraints.

Following the HEAT's early success, the Missile Command's Targets Management Office at Redstone Arsenal, Ala., asked contractors to compete for the service contract. Competing contractors were told the target must present a realistic air threat for a battalion task force in free-play, live-fire exercises with offensive and defensive phases. The scenarios would include armor, mechanized infantry, aviation, artillery, air defense and engineer assets and would contain more then 1,000 ground targets. Since the HEAT would be the only aerial target in the exercise, the 1/7-scale MiG-27 would have to provide task force commanders a chance to exercise complete air defense procedures.

The target would have to enable air defense weapons, as well as M-16s and machine guns, employed in a realistic configuration to fire at an aerial target

Scale model MiG-27s provide realistic air defense artillery training at the National Training Center.



Air Defense Artillery's new aerial targets have dual-flight capability.

while allowing the execution of all actions necessary to successfully engage hostile aircraft, including aircraft recognition, ammunition allocation, air defense warning and command and control procedures.

Continental RPVs was awarded the contract for flight service beginning in February 1983, taking over from Fort Bliss personnel who had provided service during the October 1982 to January 1983 interim. Continental RPVs' successful operation through September 1983 won the company the right to exercise contract options for continued flight service during FY84.

Since November 1982, the Targets Management Office has served as the lead development agency and the procuring and funding agency for aerial targets and flight services at the NTC. Because of the geographical separation of Redstone Arsenal and the NTC, the NTC Operations Group manages aerial target live-fire exercises while the Targets Management Office oversees aerial target technical support and contract management. Quarterly in-process reviews ensure that the Targets Management Office remains responsive to NTC needs.

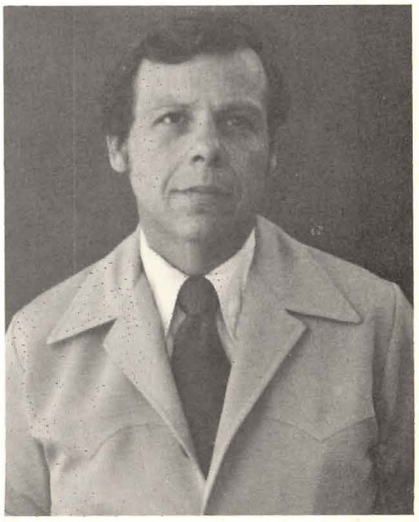
The Operations Group has compiled a list of improvements for the 1/7-scale MiG-27. The first priority is the inclusion of multiple integrated laser engagement simulation (MILES) sensors. MILES will allow Redeye and Stinger gunners organic to battalion task forces to engage targets without the expense and hazards of live missile firings. MILES will improve Redeye and Stinger proficiency scoring, strengthen the interface between air defense units and supported forces and make the impact of air defense on the outcome of the simulated battle more evident.

A second scheduled improvement is the enhancement of the target's infrared signature to facilitate the use of tracking head trainers and live missiles when a safe scenario for their deployment is devised.

A third improvement will be the enlargement of the 1/7-scale model by 25 percent, an increase in size that will make the MiG-27 replica approximately 1/5-scale of the actual Soviet aircraft. The larger target will provide a more authentic representation of the air threat and will be capable of flying flight patterns beyond the capability of the present target. For example, the enlarged model will be able to dispense CS gas or smoke from an on-board canister or may simulate an air-to-ground missile signature with on-board pyrotechnics.

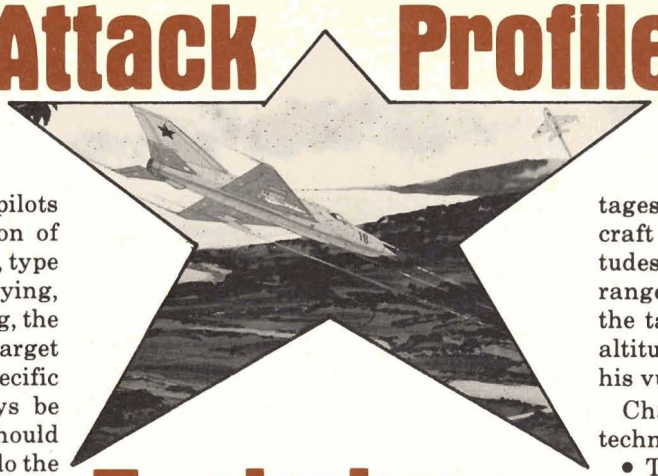
The final item on the list of priorities is to incorporate a bullet-counting system in the airborne target. The package will consist of a sensor, scoring antenna, telemetry antenna and power source. Scoring information will be transmitted to the ground and, ideally, back to the central computer for the unit commanders to use as a battle evaluation tool. As the gunners fire at the aerial target, the bullet counter will detect all bullets entering a predetermined radio-frequency field surrounding the target. The positive and immediate feedback will enhance crew training, engineering a sense of accomplishment in the gunners and building squad leaders' confidence in their weapons and crews.

The proposed improvements are technically feasible and their implementation will be limited only by budgetary constraints placed on the Targets Management Office. As technology advances and the understanding of training effectiveness increases, aerial target improvements will continue to support the realistic third dimension of combined arms training. ✱



Robert Chalmers, *formerly with Targets and Training Devices, Directorate of Training Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, is a logistics management specialist at the U.S. Army Missile Command's Targets Management Office, Redstone Arsenal, Ala. Chalmers coordinates hardware and services for the FQM-117A, MiG-27, MQM-33C and other air defense targets.*

Threat Attack Profiles and Techniques



Attack profiles used by threat pilots are determined by a combination of variables such as type of aircraft, type of ordnance the aircraft is carrying, pilot proficiency, visibility, ceiling, the assigned mission and the type of target being attacked. There is no one specific attack profile which will always be used. The air defense gunner should always expect an enemy pilot to do the unexpected.

Short-range air defense gunners who study typical threat attack profiles and techniques, however, will be able to recognize doctrinal attack profiles and techniques as they develop. They will have the same type advantage an experienced duck hunter enjoys when he recognizes a mallard's standard landing approach.

Lay-Down Technique

In the lay-down ordnance delivery technique, a threat pilot uses high speed and low altitude to increase the probability of mission success. He flies over the target area about 300 feet above the ground at 450 to 600 knots.

Ordnance release at low altitude is made possible by bomb retardation devices and special aircraft avionics. The speed of ordnance fall is reduced by drogue chutes or retarding fins which allow the aircraft to get out of the way before detonation occurs.

Pop-up Technique

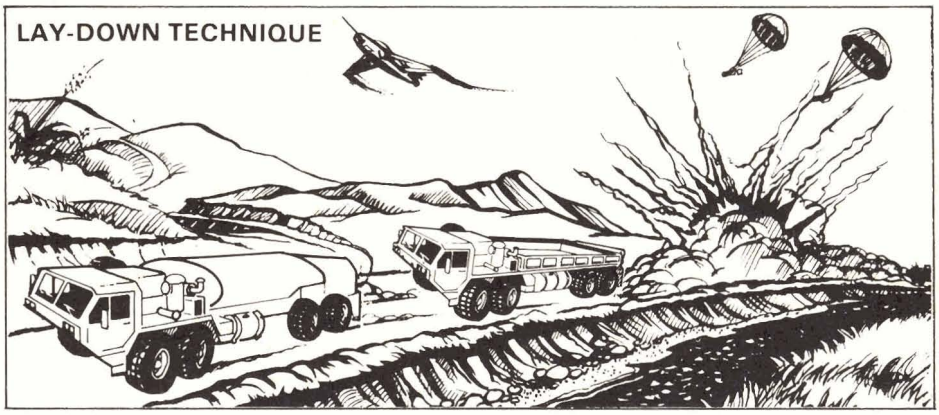
Pop-up techniques generally consist of a run at low level from an initial point about 10 to 20 kilometers from the target. The initial point is usually a significant terrain feature in the area. The aircraft flies to a pull-up point about three to eight kilometers from the target and begins a rapid climb. Once the aircraft reaches attack height, it dives to an ordnance release point. This point will vary according to the type of ordnance. It is generally located 500 to 1,500 meters from the target. After ordnance delivery, the aircraft will attempt to escape at high speed.

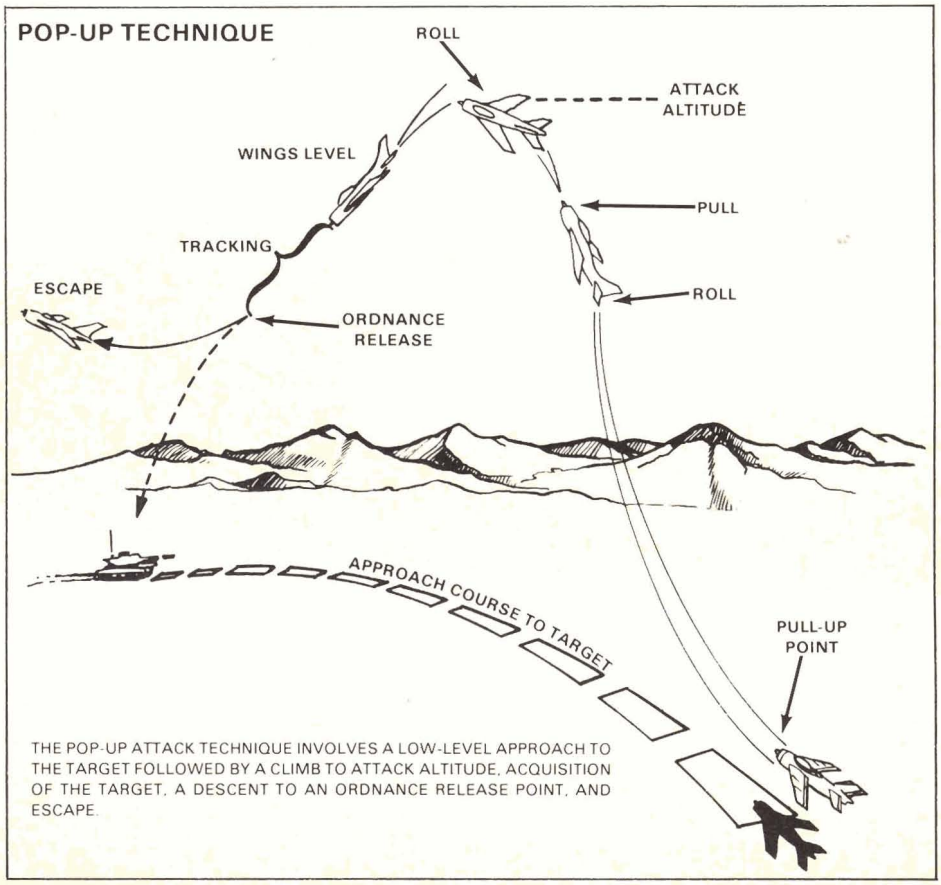
The pop-up technique offers the pilot several advantages. The low-altitude approach and escape minimize his exposure to air defenses, especially radar-directed air defense systems. He also gains deception and tactical surprise.

However, offsetting these advantages are several disadvantages. Aircraft consume more fuel at low altitudes, so the pilot has reduced his range. He also has less time to acquire the target than he would at a higher altitude. The technique also increases his vulnerability to ground fire.

Characteristics of the pop-up attack technique are:

- The attack altitude of the aircraft will be from 1,000 to 5,000 feet, depending on the type of ordnance to be released.





THE POP-UP ATTACK TECHNIQUE INVOLVES A LOW-LEVEL APPROACH TO THE TARGET FOLLOWED BY A CLIMB TO ATTACK ALTITUDE, ACQUISITION OF THE TARGET, A DESCENT TO AN ORDNANCE RELEASE POINT, AND ESCAPE.

• When the aircraft begins its dive from attack altitude to the ordnance release point, it will usually turn left or right to a new heading which is 20 to 90 degrees from the original heading.

• Airspeed during the attack is more a function of the type ordnance delivered than the aircraft's capabilities. For most ordnance, the normal speed varies from 400 to 500 knots.

Chandelle

An attack from a sudden, steep climbing combat turn, or "chandelle," is a favorite threat technique. It gives the pilot adequate aiming time while presenting a difficult target for ADA defenses. The most common approaches for strafing attacks and attacks on point targets are shown in the following examples:

Pop-up/Lay-down Attack

An attack may be made on a target of opportunity, such as a convoy, by a flight of four aircraft armed with various munitions and initially flying low to avoid ADA radar detection. The lead aircraft spots the convoy and notifies the others. They will probably separate into two elements of two aircraft each.

The aircraft execute a turn and attack using either the pop-up or lay-down technique. The presence of active ADA will normally limit the attack to one pass. The probability of aircraft survival decreases as the time and opportunities available for ADA engagement increase.

Standoff Technique

In the standoff ordnance delivery technique, ordnance is released from the aircraft at a considerable distance from the intended target. "Smart" bombs with electronic steering and guided missiles are used to achieve a high probability of hit and kill. These bombs and missiles are equipped with advanced homing guidance systems, such as active and passive infrared, TV-command and laser guidance systems.

The following are typical threat attack profiles outlined in their doctrinal publications. Remember, these are not hard and fast rules.

• Attack aircraft usually operate in pairs.

• Threat pilots use terrain features for masking.

• Targets are usually attacked from multiple directions.

• Multiple passes are made over targets to ensure destruction whenever possible.

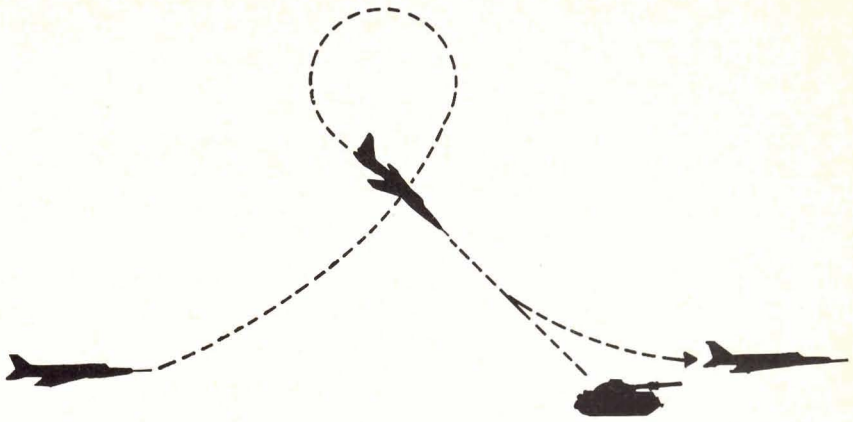
• Most munitions, especially bombs, rockets and air-to-surface missiles, are delivered more accurately from a dive of approximately five to 30 degrees.

• Threat pilots take full advantage of any apparent weakness or vulnerability such as undefended areas and disabled equipment.

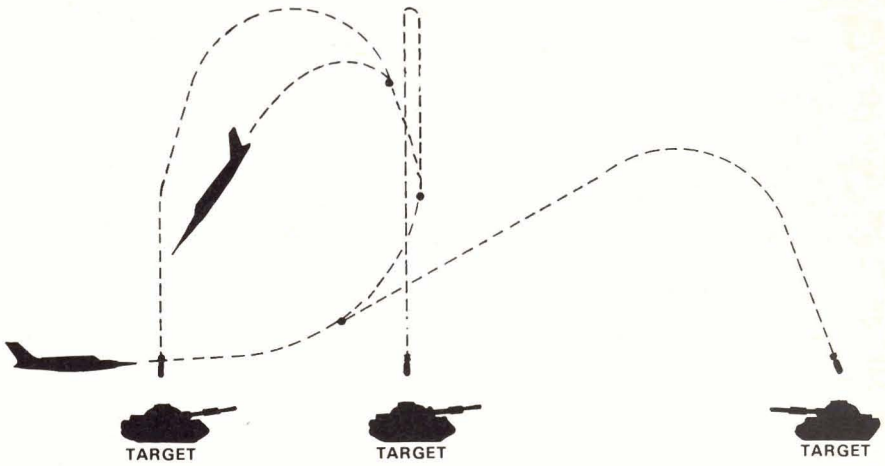
• Threat pilots use all available means to camouflage their activities and confuse friendly forces. Infrared flares, chaff and electronic jamming are part of the threat game plan.

• Threat ordnance is technically advanced and has substantial standoff ranges. Threat aircraft need not overfly the target to ensure accuracy.

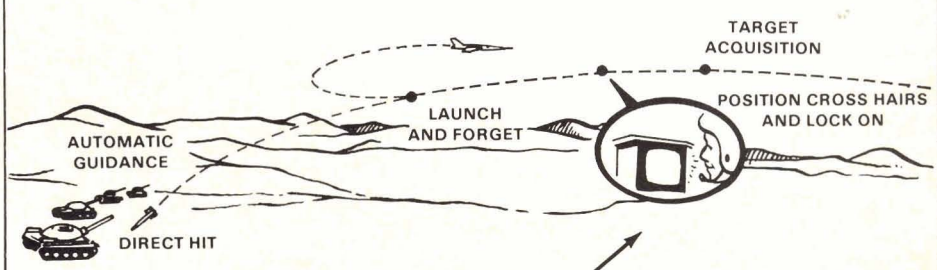
ATTACK FROM THE "LOOP"



PITCH-UP BOMBING

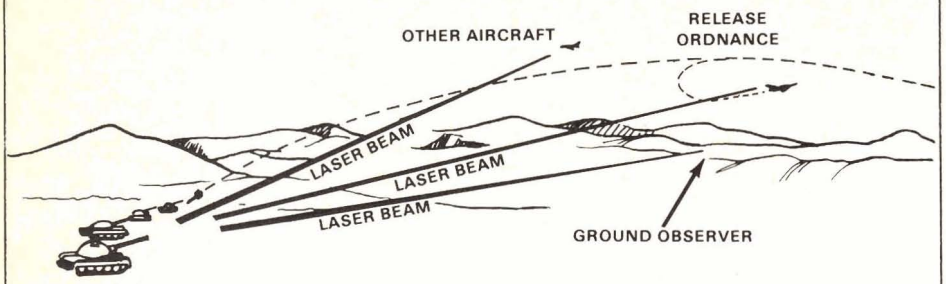


TV-COMMAND SYSTEM STANDOFF



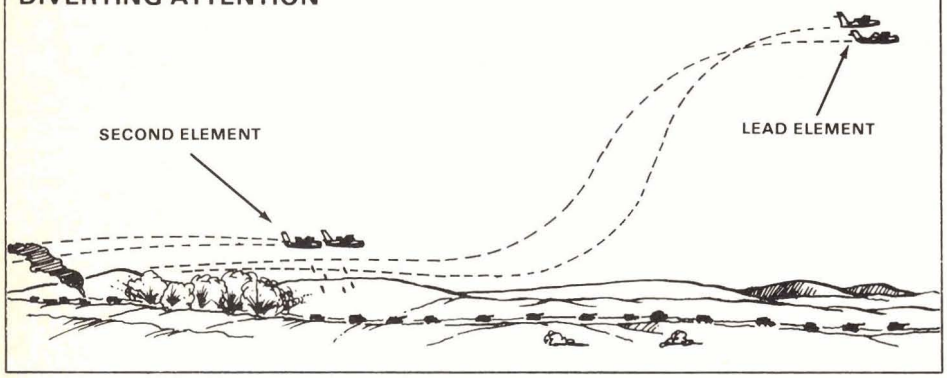
WHEN USING THE TV-COMMAND SYSTEM, THE PILOT DESIGNATES A TARGET TO THE SEEKER ON THE BOMB. THE SEEKER TRANSMITS THE TARGET IMAGE TO THE PILOT'S TV MONITOR PRIOR TO LAUNCH. THE BOMB LOCKS ONTO THE TARGET AND IS LAUNCHED. THE ELECTRO-OPTICAL BOMB HOMES AUTOMATICALLY ONTO THE DESIGNATED TARGET WHILE THE AIRCRAFT ESCAPES WITHOUT HAVING TO FLY OVER THE TARGET. THE ILLUSTRATION SHOWS THE TYPICAL SEQUENCE OF A TV-COMMAND SYSTEM.

LASER STANDOFF SYSTEM

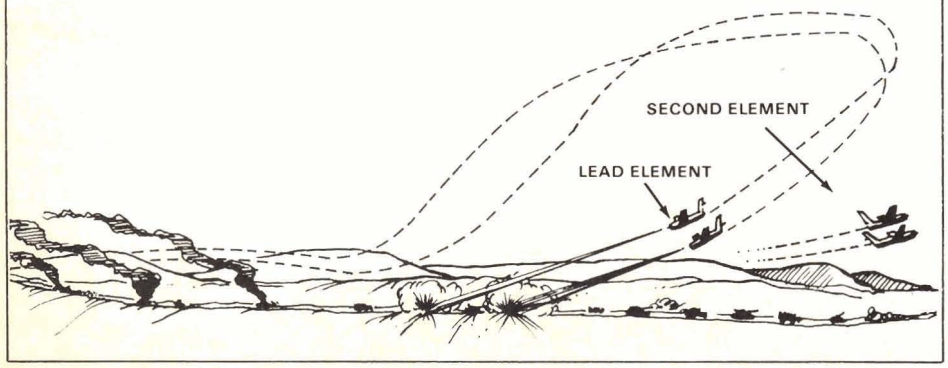


LASER-GUIDED BOMBS ARE VERY LETHAL AGAINST TANKS, AIR DEFENSE SYSTEMS, FIELD FORTIFICATIONS, ETC. THE BOMB IS GUIDED TO A TARGET ILLUMINATED (DESIGNATED) BY A LASER BEAM. THE LASER BEAM DESIGNATOR ILLUMINATING THE TARGET MAY BE THE SAME AIRCRAFT, ANOTHER AIRCRAFT, OR A GROUND OBSERVER. THE BOMB HOMES IN ON THE LASER ENERGY REFLECTED FROM THE TARGET. IF THE SAME AIRCRAFT THAT DELIVERS THE BOMB ACTS AS A DESIGNATOR, IT CAN BEGIN EVASIVE MANEUVERS AFTER BOMB RELEASE. HOWEVER, IT MUST CONTINUE TO ILLUMINATE THE TARGET UNTIL BOMB IMPACT.

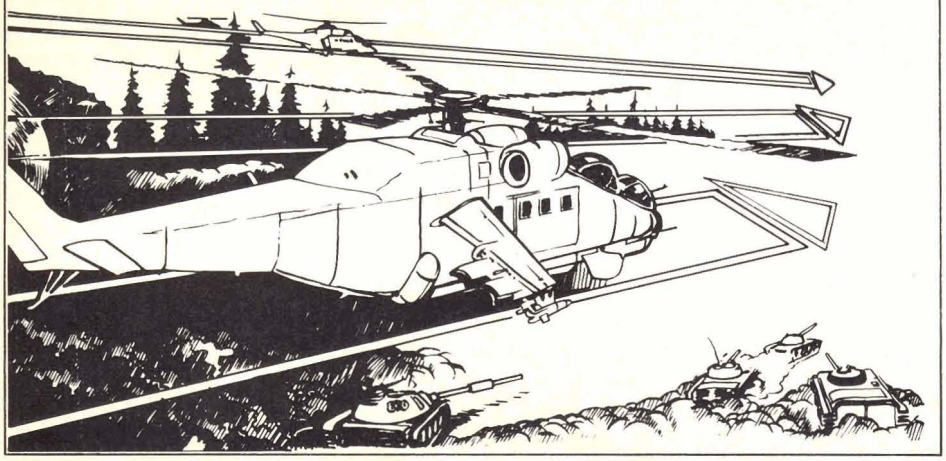
DIVERTING ATTENTION



REVERSING MANEUVER



THREAT HELICOPTERS IN SUPPORT OF THE ATTACK



Rotary-Wing Attack

Threat attack helicopters will move on the battlefield at the lowest possible altitude, often flying among trees and buildings. Because they are more agile and maneuverable than fixed-wing aircraft, attack helicopters can use ground cover to hide behind while engaging targets from standoff positions. They stay relatively close to the ground, except when firing. Therefore, attack helicopters are difficult to acquire and, because they are seen as part of the ground environment by air defense systems, are hard to lock onto and engage.

The attack helicopter, using nap-of-the-earth and sneak-and-peek techniques, will survey the battlefield for targets. Upon spotting a target, for example, the helicopter pilot will use some sort of natural terrain such as a forested area or hill to hide behind and, when the opportunity presents itself, will pop up over the terrain feature and launch his anti-tank guided missiles at the target.

A threat attack helicopter gunner needs only about 20 to 30 seconds to find his target and guide his ATGM to intercept. Currently, threat helicopters must visually guide their ATGMs to the target. After firing on the target, the pilot will probably execute a side-slipping maneuver for a quick reduction in altitude before withdrawing to a safe area.

Threat combat helicopters practice attacks against targets from horizontal flight, from a gentle dive, from a pitch-up, from a hovering (pop-up) position and from the ground.

In any major conflict of the future, the air battle will commence with a sudden attack by large numbers of aircraft on multiple targets. The attack will most likely be launched with little or no warning. A familiarity with typical threat attack profiles and techniques will help SHORAD gunners make the price the enemy pays in an attack on high-priority targets as high as possible.

"Threat Attack Profiles and Techniques" is extracted from FM 44-3, Air Defense Artillery and Employment, Chaparral/Vulcan/Stinger, scheduled for publication by the U.S. Army Air Defense Artillery School this summer.

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Let's Bring Back the RPV

by MAJ Richard J. Armour

Recent experiences with remotely piloted vehicles in the Middle East and the growing need for information on the battefield have created a great deal of interest in RPVs for military use. Improvements in technology and RPV design now make possible the development and production of RPVs that can provide surveillance of a battlefield area and send the information, on a real-time basis, to the ground commander for timely and decisive decisions.

As demonstrated by Israel during its 1982 invasion of Lebanon and its actions against Syrian surface-to-air missile sites in the Bekaa Valley, RPVs can be used quite effectively as intelligence collectors and as decoys simulating the radar cross section of actual, full-size combat aircraft.

A February 1982 *Armed Forces Journal International* article, titled "Where Have All The RPVs Gone?" stated there is not one RPV in operation today in the U.S. armed forces. Out of 986 RPVs once built, only 33 exist in the United States, and they are in storage. The only Western nation which has operational RPVs is Israel. Some of these are versions of American ones and some are the new mini-RPVs developed by Israel.

The United States last used RPVs in Vietnam. It is claimed that 3,435 unmanned RPV missions were flown by the Strategic Air Command over North Vietnam, China, Laos and elsewhere. These RPVs brought back intelligence from deep within hostile territory at a fraction of the cost of, and without risk to, manned reconnaissance aircraft.

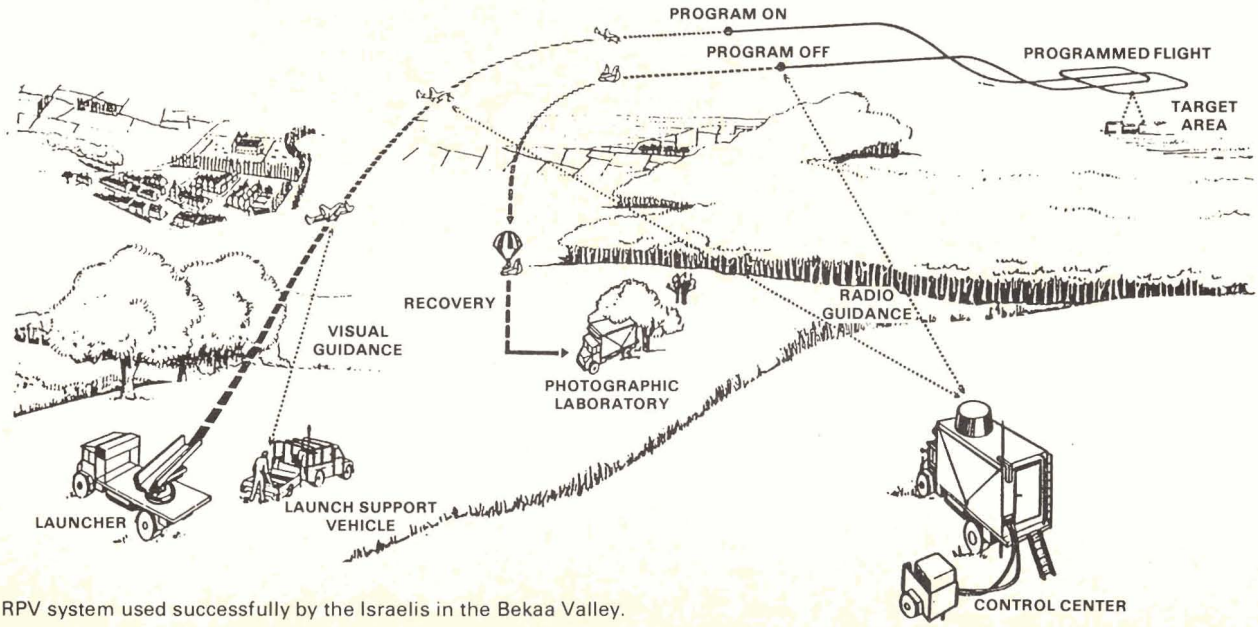
It may be useful to re-examine the role of RPVs in the 1982 Israeli invasion of Lebanon, their most recent use. Although this subject has been discussed at length since the war, everyone may not be aware of just how Israel used the RPVs and how successful they really were.

The Israelis used two types of RPVs during their operations. The first, the Scout, is propeller-driven, has a length of about 12 feet and a wingspan of 11.8 feet. For maximum endurance, the Scout flies at a speed of 63 mph and can remain aloft for four and a half hours. The vehicle has a maximum altitude capability of 10,000 feet and can carry a 50-pound payload consisting primarily of a TV camera.

The other RPV used by the Israelis is the Mastiff, which is slightly smaller than the Scout. This vehicle is also propeller-driven and measures 8.2 feet in length with a wingspan of 13 feet. The Mastiff has a service ceiling of 10,000 feet and can stay aloft for three to four hours at a speed of 43 to 55 mph. The platforms are fitted with cameras for photoreconnaissance missions.

These RPVs have a small radar cross section, according to *Aviation Week*

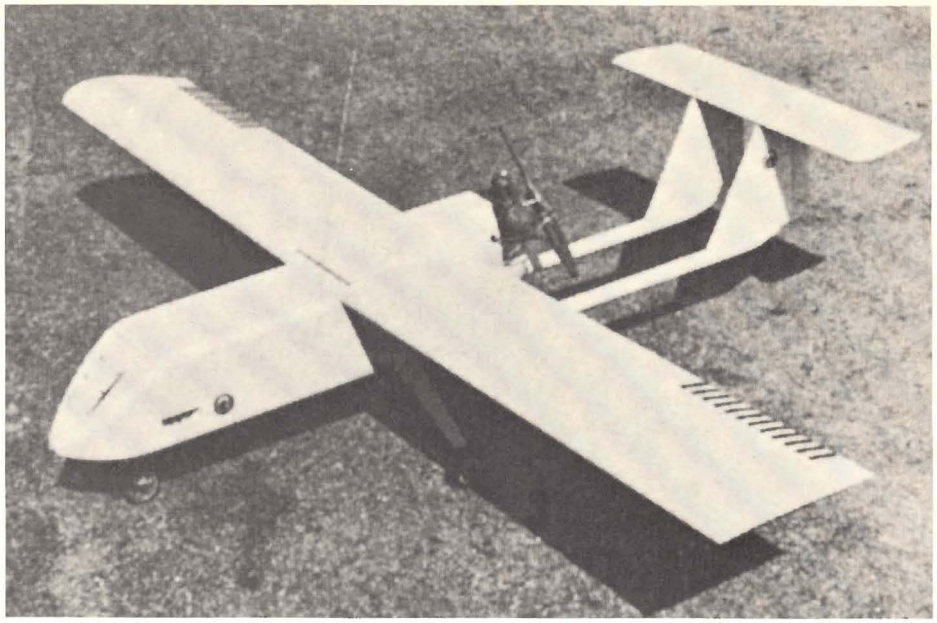
The Scout RPV



Typical RPV system used successfully by the Israelis in the Bekaa Valley.

and Space Technology (July 5, 1982). They have a small infrared signature and contain a high percentage of composite materials in the airframe, making them difficult to be detected and destroyed.

The Scout is believed to have a wide range of payloads in addition to its TV camera. In October 1982, *Defense Electronics* stated that these sophisticated payloads can give the Scout an electronic countermeasure capability of its own. The Scout reportedly has been used to drop flares during missile suppression raids to distract Syrian infrared-seeking missiles. The RPV can also be fitted with a laser designation system to illuminate a target with laser energy so it could be attacked by weapons carrying laser trackers. In addition, forward looking infrared radar, night vision systems and an automatic pilot can also be fitted on the Scout.



The Mastiff RPV

The technology section of *Business Week* reported in November 1983 that the Scout was used successfully as an electronic warfare asset in the Bekaa Valley during June and July 1982. Several tiny fiberglass RPVs, beaming electronic signals simulating Israeli jets, entered the threat area, causing the Syrians to turn on their surface-to-air missile radars. The locations of these Syrian defenses were then reportedly data-linked from the Scouts to an E-2C command and control aircraft which, in turn, directed Israeli F-4s with bombs and anti-radiation missiles to strike the sites. The article stated that with the surface-to-air missile defense minimized, Israeli F-15s and F-16s destroyed 86 Syrian aircraft with no losses. This success clearly shows two aviation functions accomplished by the small RPV, those of electronic warfare and command and control as a data-link repeater.

Defense Electronics quotes an individual who had hands-on knowledge of the Scout. "One of the most exciting TV pictures I have ever seen was when four aircraft were taking off from a base in Syria, trying to find the Scout, while we were watching them through its gimballed camera. They never found it, but we watched them as it was happening. This was real-time information."

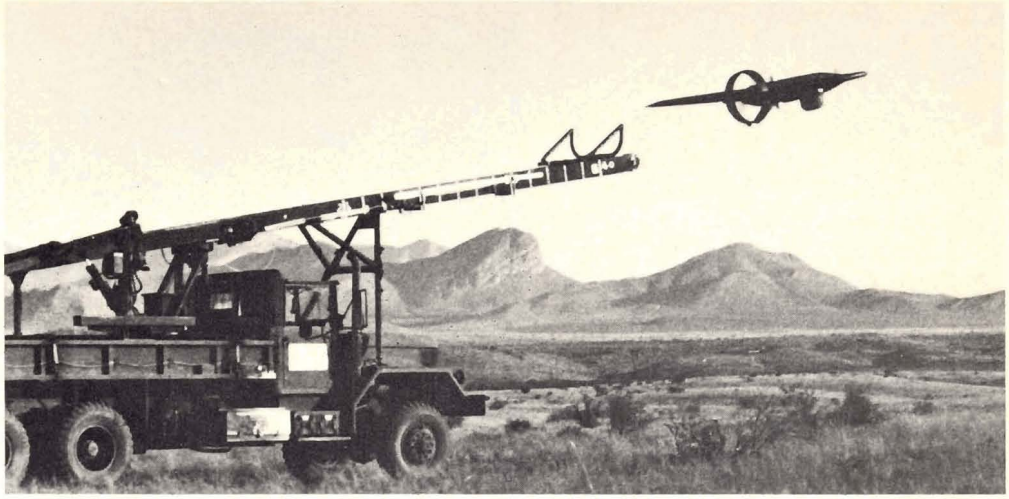
Although the RPVs could be fitted with an autopilot and be preprogrammed to fly a designated route, a great number of flights were controlled by an individual using a joystick-type of flight control. In the case of the Scout, the vehicle's TV camera was used as the eye through which it was guided and flown. It was soon discovered that a major advantage of using an RPV with a TV camera was that the real-time data could be recorded on videotape as it was being relayed to the ground station, then enlarged and used for intelligence purposes. Another advantage was that the videotapes could be stored for future analysis and evaluation.

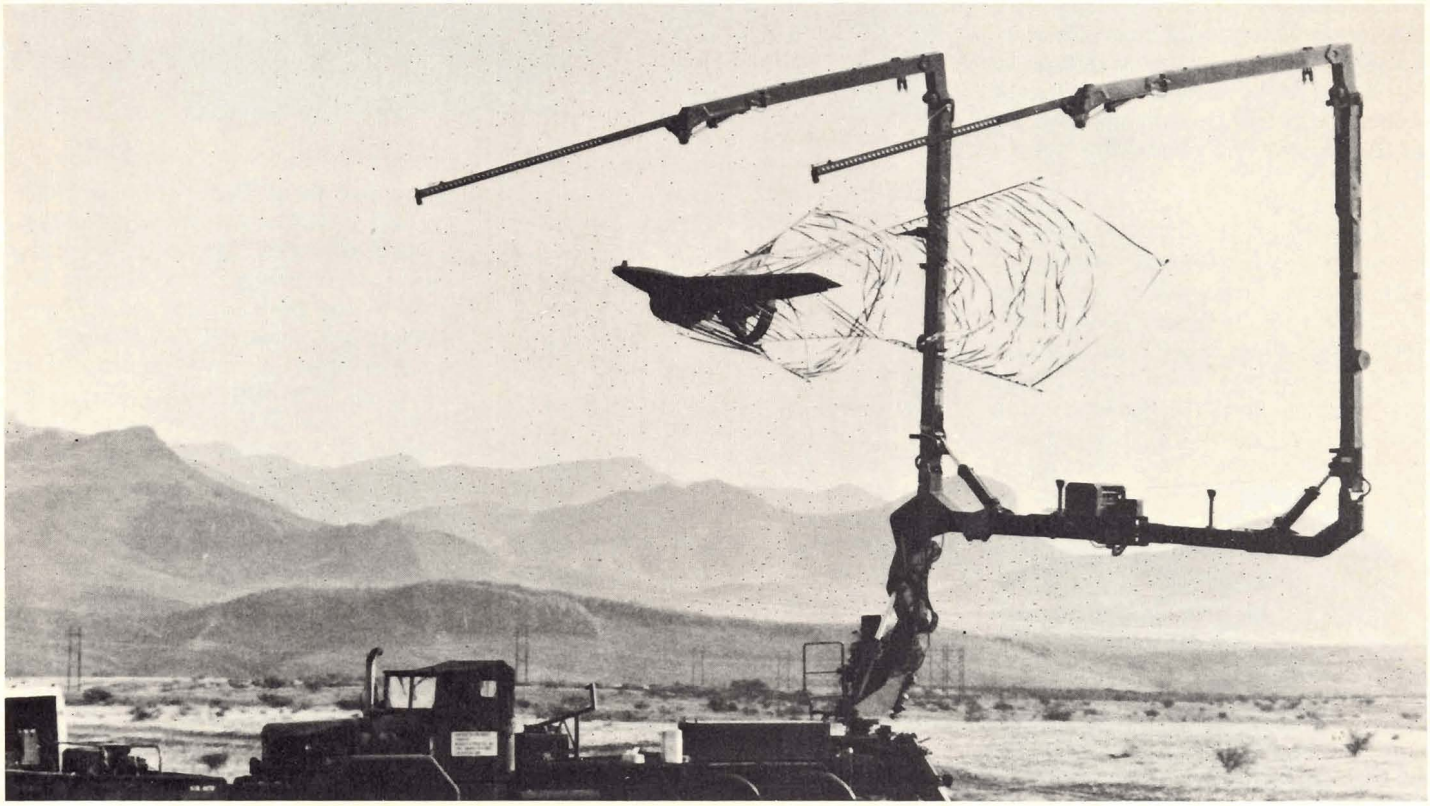
RPVs also were used successfully in the ground war. The Scout, with its high-quality resolution TV camera, was used to track both friendly and enemy vehicles and tanks. Forward air controllers used this information to guide attack aircraft to selected targets and to monitor target damage after the strikes. When using the TV camera, the Scout can view an area of about 19.3 square miles from an altitude of 1,000 meters. The camera is equipped with a zoom lens allowing the gound observer to zoom in on an area as small as 50 meters by 40 meters for closer identification of an object or area. Full zoom time for the camera is about two seconds.

The U.S. Army is currently testing an RPV, called the Aquila. According to *Armed Forces Journal International,* this vehicle was developed for locating and designating artillery targets at brigade and division level. The Aquila will fly either preprogrammed or manually directed flight profiles and send back real-time imagery from behind

The Scout RPV on launcher

The U.S.-built Aquila RPV (right) is launched and later recovered (below) during tests at Fort Huachuca, Ariz. (Photos courtesy of Lockheed Missile & Space Co., Inc.)





enemy lines. It can also give laser target designation for laser-guided munitions. It can fly for up to three hours at a speed of about 110 mph. In recent tests at Fort Huachuca, Ariz., the Aquila beelined, loitered and jinked to avoid enemy fire. After each flight, it returned to its retrieval net for recovery and was reportedly readied for relaunch in 30 minutes.

While no definitive Soviet RPV development program has been noticed, the Soviets have been using drones for some time as targets for their surface-to-air missile units. It is highly probable that they would develop RPVs capable of carrying the same types of payloads as Western RPVs and having the same types of missions. It has been seen in the past how the Soviets like to copy Western military developments and it is obvious that, after having observed the success of Israel's RPVs, they will proceed on a program to develop and employ similar type vehicles.

Now that Israel has proven the usefulness and value of RPVs, we can expect to see other nations, both in the Western bloc and the Soviet-Warsaw Pact, begin to develop these small, relatively inexpensive, expendable vehicles for use in reconnaissance and intelligence gathering, decoy missions, target designation and other missions where the use of manned aircraft might be too costly or pose an unnecessary risk to the pilot. There can be little doubt that, as successful as RPVs have proven to be, they will be even more useful and valuable in the future.

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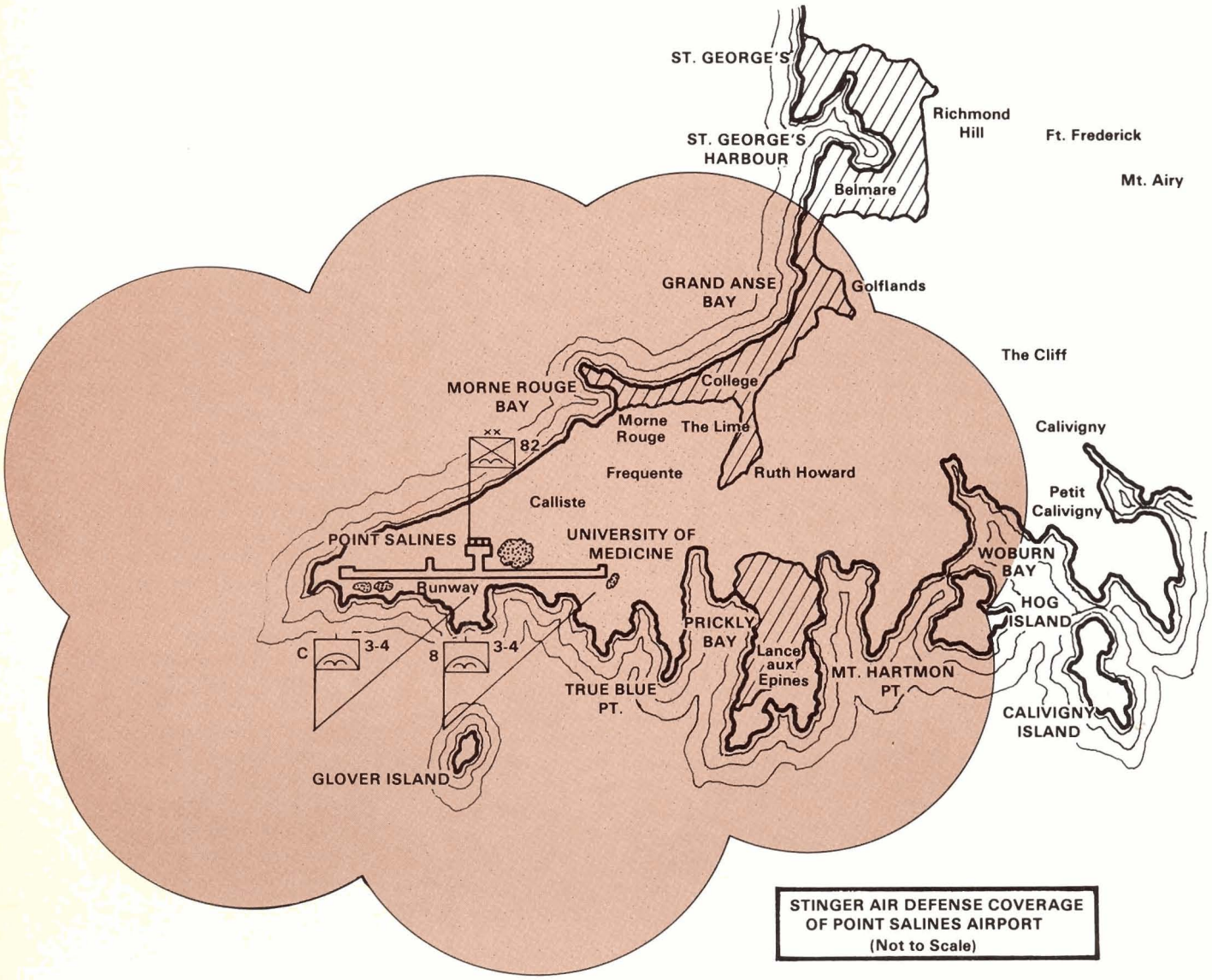
MAJ Richard J. Armour *is the chief of the Security and Information Branch, Threat Division, Directorate of Combat Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas. A graduate of New York University, he has served in several air defense artillery assignments, including Germany and Korea.*

AIR DEFENSE IN GRENADA

by CPT James L. Collins and CPT David M. Casmus



STINGER AIR DEFENSE COVERAGE OF POINT SALINES AIRPORT
(Not to Scale)

The primary mission of the 82nd Airborne Division is to be prepared to move on no-notice to any place in the world by air or airborne assault and to fight immediately on arrival. On Oct. 25, 1983, that mission exploded into reality as American forces launched a two-pronged parachute and heliborne assault against Cuban and local forces on the Caribbean island of Grenada. Major elements of the 82nd Airborne Division conducted air-land assaults onto Point Salines Airport. Among those elements were paratroopers from the 3rd Battalion (Airborne), 4th Air Defense Artillery.

"I was at home, getting ready to retire for the evening. It was about 9 p.m. and I told my wife that, because I had an early training meeting at about 6 a.m., I was going to try and get some sleep. No sooner had I gotten my boots off than the phone rang. It was the CQ who told me there was an alert and that it wasn't a test."

CPT David Casmus, former commander of Battery B, 3rd Battalion, 4th Air Defense Artillery, had little idea how important that phone call would be.

"All the way in I was thinking, where the hell could we be going? They had just bombed [the Marine barracks] Lebanon. I was sure we were heading for somewhere in the Middle East in retaliation, if for nothing else than as a big show of force for what had happened in Lebanon. I really hadn't suspected that Grenada was the target area."

Soldiers of the 82nd Airborne engage in operations in Grenada. The United States, Jamaica, Barbados and six nations of the Organization of Eastern Caribbean States made up the multinational force.

The involvement of the 3/4 ADA in that postage stamp Latin American island was not haphazard. One air defense artillery line battery is aligned with each infantry brigade within the 82nd Airborne. Battery A is attached to the 1st Brigade, Battery B to the 2nd Brigade and Battery C to the 3rd Brigade. Battery D provides general support to the division. From N-hour, the actual time of notification, to wheels up, these organizations are modified according to the nature of the mission and increasing knowledge of the situation.

The deployment to Grenada was accomplished in two phases, an assault echelon and a follow-on echelon. The assault echelon was the first element to enter the objective area. It was a specifically tailored light force. In the follow-on echelon were those elements required to sustain combat operations.

The Assault Echelon

The assault echelon into Grenada consisted of the division assault command post, Division Ready Force No. 1 and Division Ready Force No. 2 from the 2nd Brigade, 82nd Airborne Division, and the 2nd Brigade assault command post. Upon notification for deployment, a myriad of tasks had to be accomplished utilizing the N-hour sequence. At N+2 hours, the division commander and his staff briefed the operation, called Urgent Fury, to the brigade commanders, separate battalion commanders and key personnel. Immediately following the N+2 briefing, the Division Ready Brigade No. 1 commander conducted a briefing for his battalion commanders and his attachments, which are normally referred to as "the combat slice."

Briefly, the slice consists of the division's combat and combat support elements that habitually fight together as a task force. The slice can be tailored to meet the greatest threat or pared down in certain areas if a particular threat is minimal. At the briefing, it was determined that the assault force would be deployed light. This meant that all vehicles would be left behind and all equipment would have to be man-packed into the objective area.

The assault force was tailored as two infantry battalions, two field artillery batteries, an engineer platoon and a military police platoon. The initial air defense element for the assault force consisted of four Stinger teams and a headquarters element. Each air defense artillery paratrooper carried one Stinger and a PRC-77 radio.

The decision to deploy with minimal air defense was based on intelligence of the air threat as being extremely limited, possibly non-existent.

"I think we were utilized as effectively as we could have been at the time," said Casmus. "At first I was disappointed with the tailored force that went in. But when you realize that four teams from our battery deployed with *the* assault force that went in on *the* day, that was something! On occasion I felt cheated by my brigade only in the sense that I wanted more. But then so did the infantry commanders want more, so did armor and the signal folks. Everyone wants in on the operations, whether they be training or whatever—and that's a pretty tough job for the brigade commander. He's got to make the force work because he's the boss. And he has to have the confidence in you that the information you're passing to him is, in fact, adequate and accurate. So, with the information we had, four teams were sufficient."

The primary air defense mission was to defend the airhead at Point Salines Airport and the field artillery batteries. These two assets were essentially collocated and the four teams provided excellent air defense coverage.

"We really didn't know what to expect when we got there," said CPT James L. Collins, Battery C commander. "The average soldier didn't get a firm grip of what was actually happening on the ground. The majority of the Stinger personnel were there for six days from the beginning, Oct. 26, and came back on Nov. 1 and 2. I had one team that stayed on through the 9th.

"Initially, we prepped the 2nd Platoon (Vulcan), but the mission changed and Vulcans were not required to go. So my brigade, the 3rd Brigade, deployed with only Stinger assets. The only elements involved from our standpoint were the air defense fire support officer for the brigade, the Stinger section headquarters, myself and CPT Casmus as a link between the Stingers and the division."

The Follow-on Echelon

The follow-on echelon consisted of combat and combat support elements

from the 3rd Brigade, 82nd Airborne Division. Upon taking command of Division Ready Brigade No. 1, the brigade commander made the decision to deploy all his assets to include the "slice." The brigade would initially deploy light as the assault force did. The primary mission of the brigade was to enlarge the airhead and to be prepared to conduct ground operations.

The brigade command post deployed with an air defense fire support officer who provided the brigade commander expertise on air defense employment. As a result, all the Stinger assets deployed as their habitually supported unit moved into the airhead.

Twenty-seven Stinger teams were deployed by Oct. 30, defending the entire airfield, division support command and division headquarters. One Stinger team deployed to Pearls Airfield to provide air defense coverage of 3rd Brigade elements.

Though neither Casmus nor Collins were involved with any of the ground fighting, some of their men drew hostile fire.

"One of our NCOs got fired on—about five rounds kicked up 10 feet in front of him," said Collins. "One of our lieutenants [1LT Kirk Lawrence of Battery B] was in the tactical operations center that was raked by 20mms, but he didn't get hurt. He later administered first aid and helped to evacuate the wounded at his location."

Lessons Learned

A valuable learning experience was gained by both the paratroopers and the chain of command as a result of Urgent Fury. This operation required all Stinger assets, including the section headquarters, to deploy without organic transportation.

Without transportation to carry team equipment and the basic load of Stinger missiles, the Stinger teams were severely limited in firepower, communications and mobility. This raises the question, "How man-portable is Stinger?" The average load carried by a paratrooper was 75 pounds. This included only minimal contingency items, one change of clothing and ammunition.

The 3/4 ADA brought this captured ZSU-23 anti-aircraft gun home with them from Grenada.

The gunner also carried one Stinger weapon round, flak jacket and load-bearing equipment. The team chief carried an additional PRC-77 radio. The total weight carried by the average air defender was between 105 and 115 pounds. This weight made it almost impossible to have Stinger teams move with maneuver units in the rugged hills of Grenada.

With such a heavy and bulky load, it was extremely difficult to carry the Stinger with its current sling. A modified harness must be designed to balance the Stinger system. Since the Stinger teams were dismounted, resupply of Stinger rounds became an immediate concern. If resupply brought only missile rounds after the initial ones were expended, there would be a need to store the separate gripstock.

Currently there is no way to store the gripstock while traveling dismounted. A storage bag needs to be developed so that a soldier can attach it to his equipment until resupply can be completed.

Several battery coolant units were diagnosed as unserviceable as a result of handling in the field. Currently there is a battery coolant case which can be ordered. There should be a requirement to issue the case to the unit or place it in the weapon round container.

Due to some adverse weather encountered during Urgent Fury, Stinger systems were constantly subjected to the elements. The majority of the Stinger teams placed field expedient protective covers over the systems. That action probably insured that the rounds did not get contaminated. There is, therefore, a need for a fabric protective case when the Stinger system is to be deployed outside its shipping and storage containers for an extended period of time.

"Naturally, the experience lends itself to a lot of lessons learned," said Casmus. "I think, without sounding boastful, the brigades and batteries proved that they worked well together. You've got to train as a combined arms team every time you go to the field. Short of that, you're cheating yourself, and cheating the unit that's depending on you.

"Our batteries must habitually associate with the same units and know the personnel, because in a fast-paced environment, you've got to know the idiosyncrasies of those you're supporting. That really proved more so than I thought possible in Grenada."

Although the Vulcan platoons did not deploy due to the limited air threat and limited airframes, Vulcans were prepared to deploy in support of the division just as the Stinger sections deployed. The Vulcan platoons, FAAR platoon and all support elements are a vital and integral part of the air defense team in the division.

The paratroopers of the 3/4 ADA played a signicant role in the 82nd Airborne Division's mission.

"We proved we could rapidly deploy," said Casmus. "We proved we could accomplish the mission. We proved we could be tailored to meet the specific needs of a force."

Operation Urgent Fury also proved that air defense elements are an integral part of the combined arms. The troopers demonstrated all those professional attributes of a highly trained combat unit which made the deployment to Grenada a rewarding experience to both commanders and troopers alike.

"No matter what school of thought you follow," said Casmus, "how you train soldiers in peacetime is precisely how well they are going to react in a combat situation. So anyone who says, 'We do this here at the training area, but in real combat we're going to do something different,' has another think coming." ✱

CPT James L. Collins *is commander of Battery C, 3rd Battalion (Airborne), 4th Air Defense Artillery, 82nd Airborne Division. He attended New Mexico Military Institute and holds a degree from Arizona State University. He is a graduate of the Air Defense Artillery Officer Basic Course and the Infantry Officer Advanced Course.*

CPT David M. Casmus *is assigned as an instructor in the Command and Staff Division, Tactics Department, U.S. Army Air Defense Artillery School. He holds a bachelor's degree in biology from Canisius College. His previous assignment was commander of Battery B, 3rd Battalion (Airborne), 4th Air Defense Artillery, 82nd Airborne.*

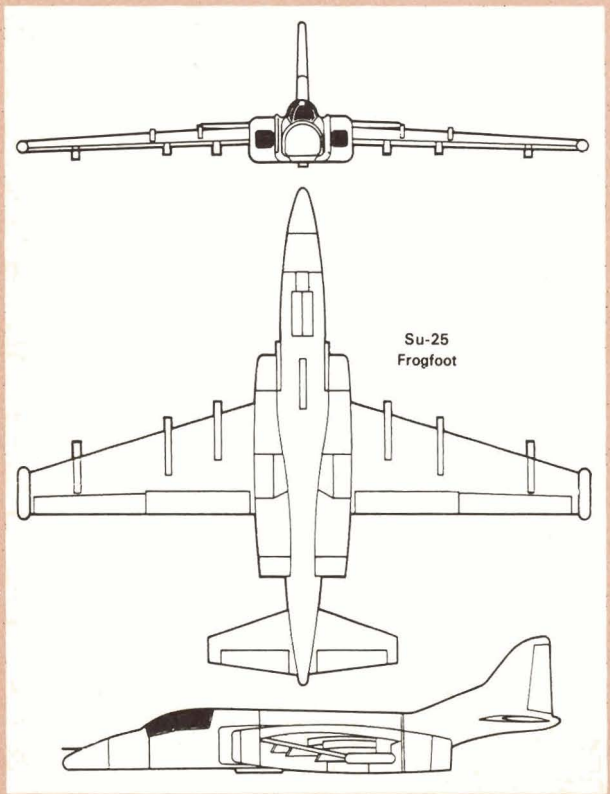
Soviet New Generation Aircraft

Past issues of *Air Defense Artillery* have reported the development of several new Soviet aircraft. Some have been deployed, while others are soon to be operational. Reports are that the Soviet Union is producing aircraft at a rate of more than 1,000 a year. This compares to roughly 180 aircraft a year for the U.S. Air Force and 170 a year for the Navy.

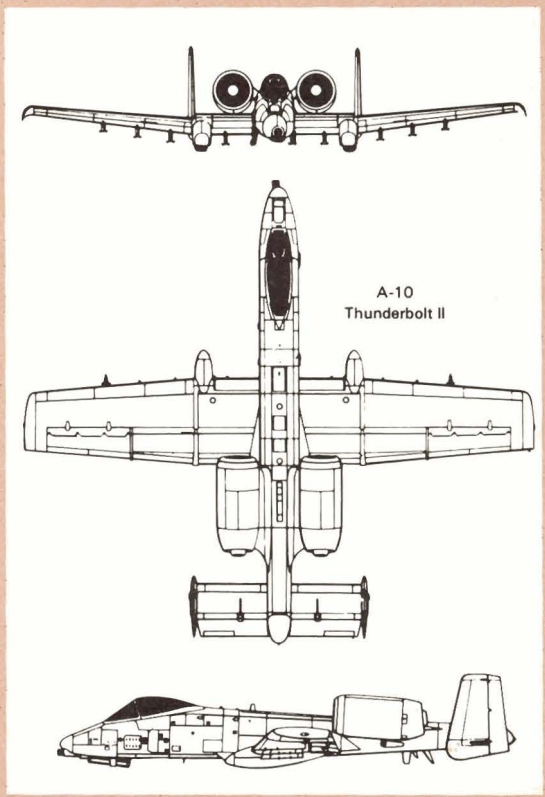
Of the following aircraft, only the Su-25 Frogfoot was included in the recently distributed FM 44-30, Visual Aircraft Recognition. The three-view drawing published in the field manual has been updated. Those new aircraft that have ground-attack capability or pose a threat to ground forces will be included in future revisions of FM 44-30. For further information about a specific aircraft, refer to cited publication dates of *Air Defense Artillery*.

Compiled from Air Force Magazine, Aviation Week & Space Technology, Jane's All The World's Aircraft, International Defense Review and Soviet Military Power.

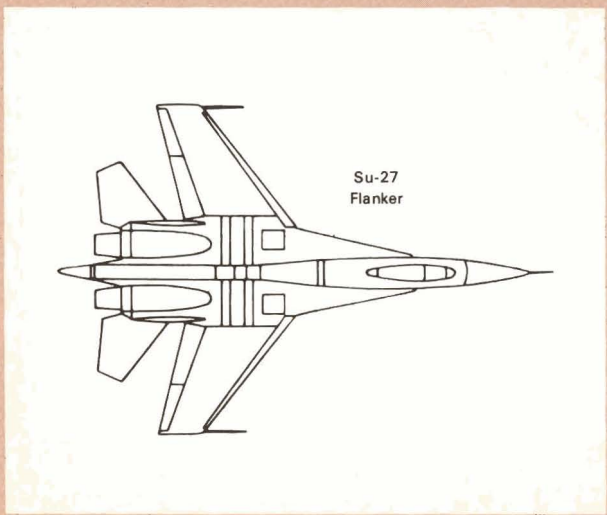
Su-25 Frogfoot (Oct-Dec 82, Page 57; Spring 1983, Page 40)



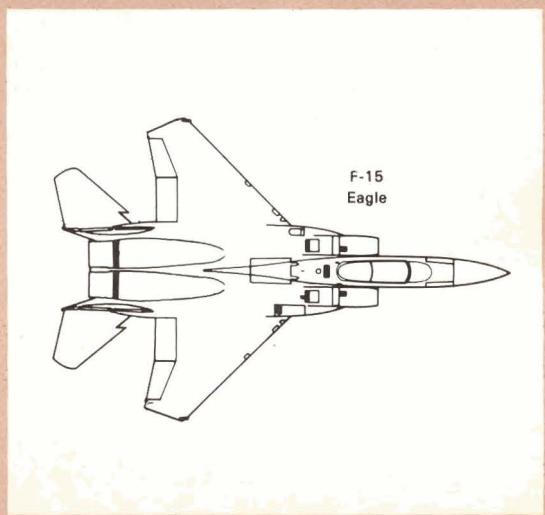
Formerly known as the Ram-J, this subsonic, close-support attack aircraft is being used in combat operations in Afghanistan. It is armed with a 30mm Gatling-type gun for anti-armor missions and can carry laser-guided munitions. Although equivalent in some ways to the A-10 Thunderbolt II, it is considerably faster.



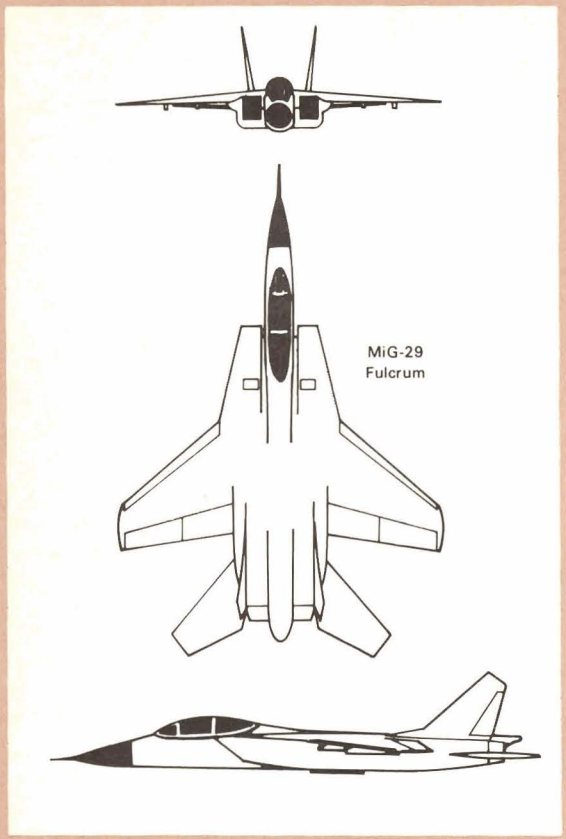
Su-27 Flanker (Oct-Dec 82, Page 57; Spring 1983, Page 40)



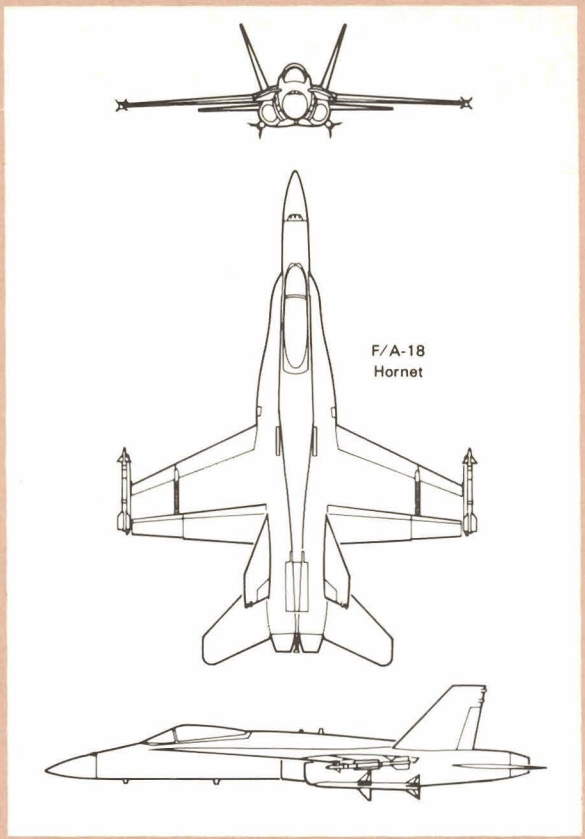
Formerly known as the Ram-K, the Flanker is expected to be operational this spring. Slightly larger than the F-15 Eagle, the single-seat, twin-jet Flanker is armed with medium-range, air-to-air missiles and is equipped with a pulse Doppler look-down, shoot-down weapon system, infrared search and track set, digital data link and heads-up display.



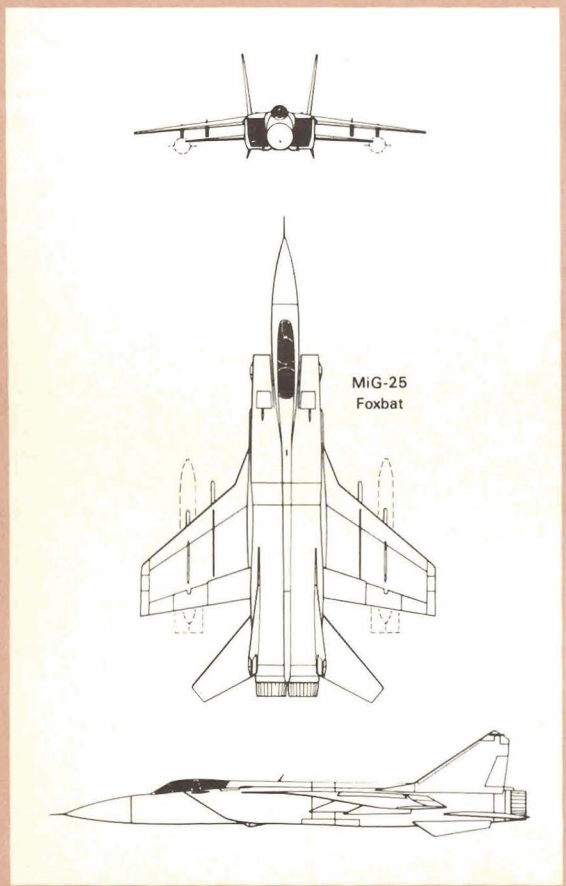
MiG-29 Fulcrum (Oct-Dec 82, Page 19; Spring 1983, Page 40)



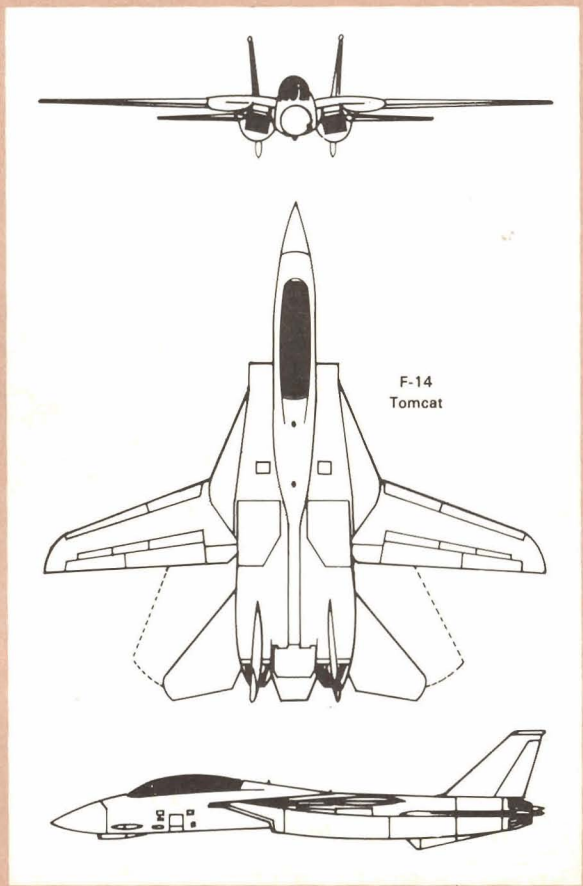
Some sources say that this fighter aircraft, formerly known as the Ram-L, is scheduled to become operational this spring. However, *International Defense Review* reports that it became operational at the beginning of October, 1983. The Fulcrum, which is in the same class as the F/A-18 Hornet, has look-down, shoot-down capability.



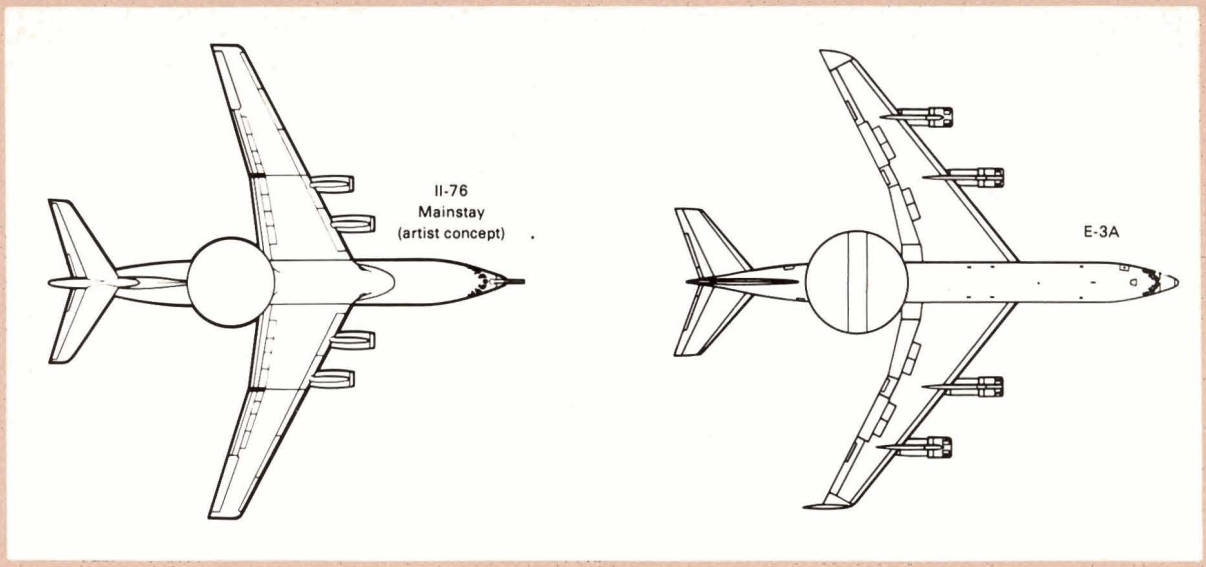
MiG-31 Foxhound (Oct-Dec 82, Page 57)



A derivative of the MiG-25 Foxbat, this interceptor has look-down, shoot-down capability and is thought to be designed for use with the Il-76 Mainstay AWACS. Formerly known as the Super Foxbat, this aircraft compares to the F-15 Eagle and the F-14 Tomcat. It is believed that the Soviets are deploying the Foxhound to four regiments.

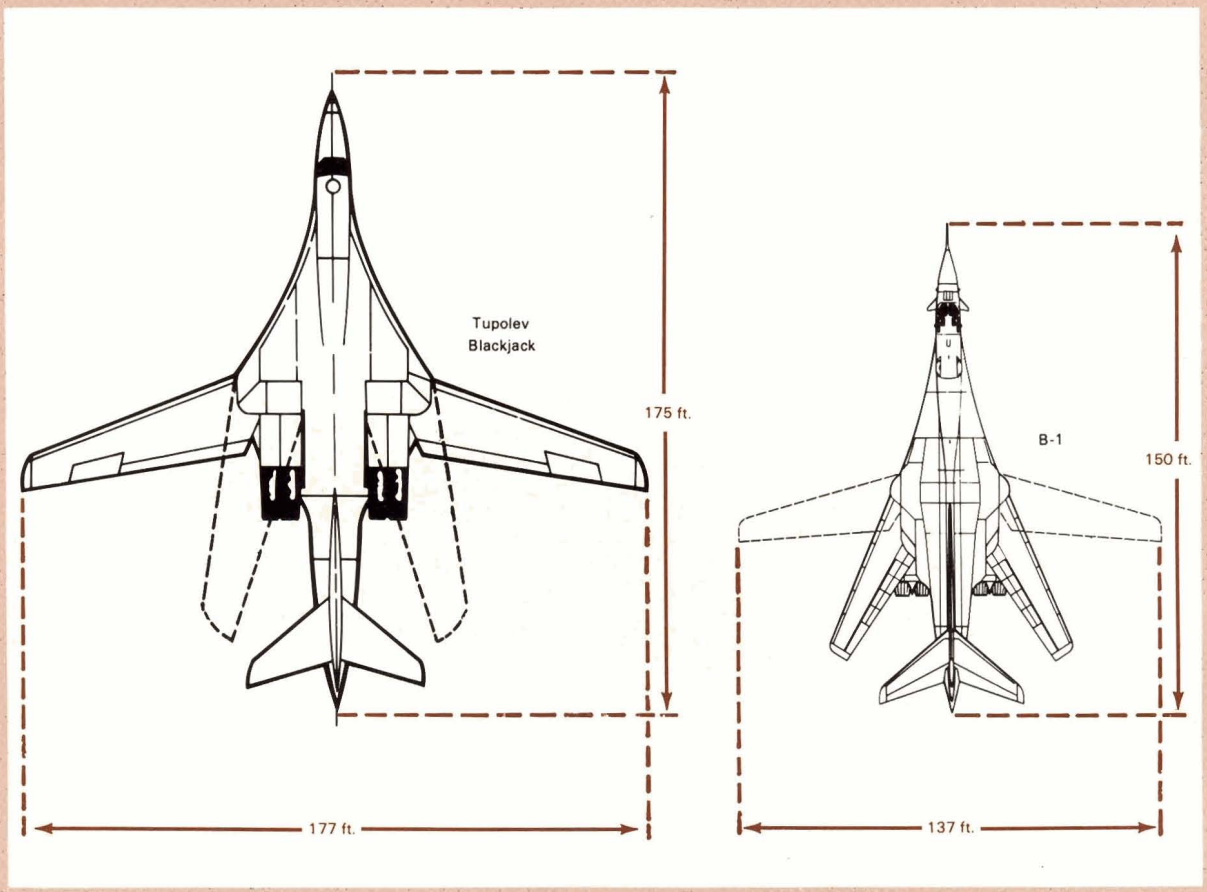


Il-76 Mainstay AWACS (Oct-Dec 82, Page 57; Fall 1983, Page 55)



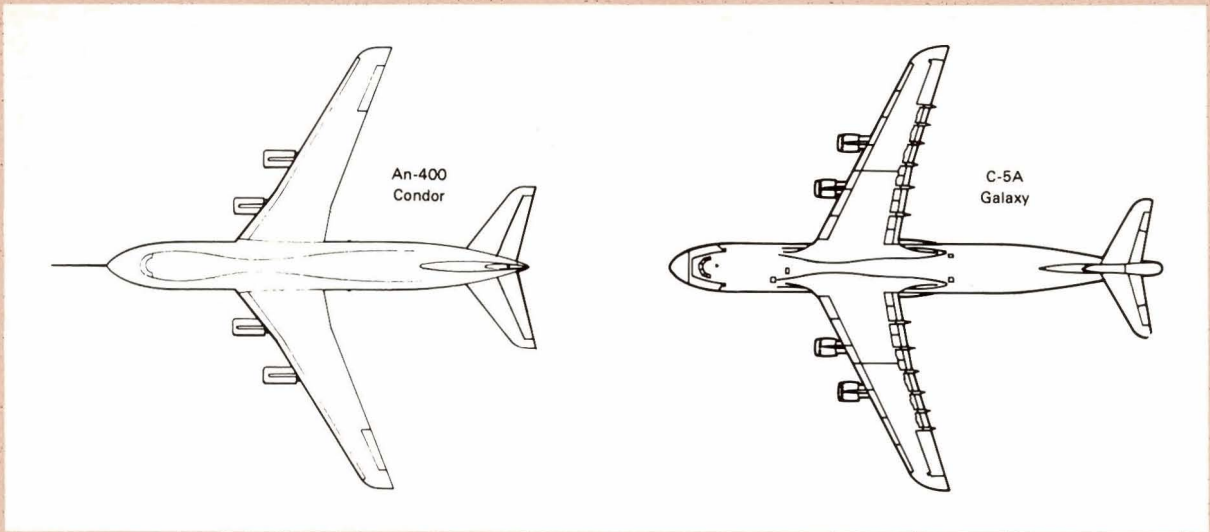
This extensively modified version of the Il-76 Candid is expected to become operational by the end of 1984. The Mainstay will replace the Tu-126 Moss AWACS.

Tupolev Blackjack (Oct-Dec 82, Page 57; Spring 1983, Page 40)



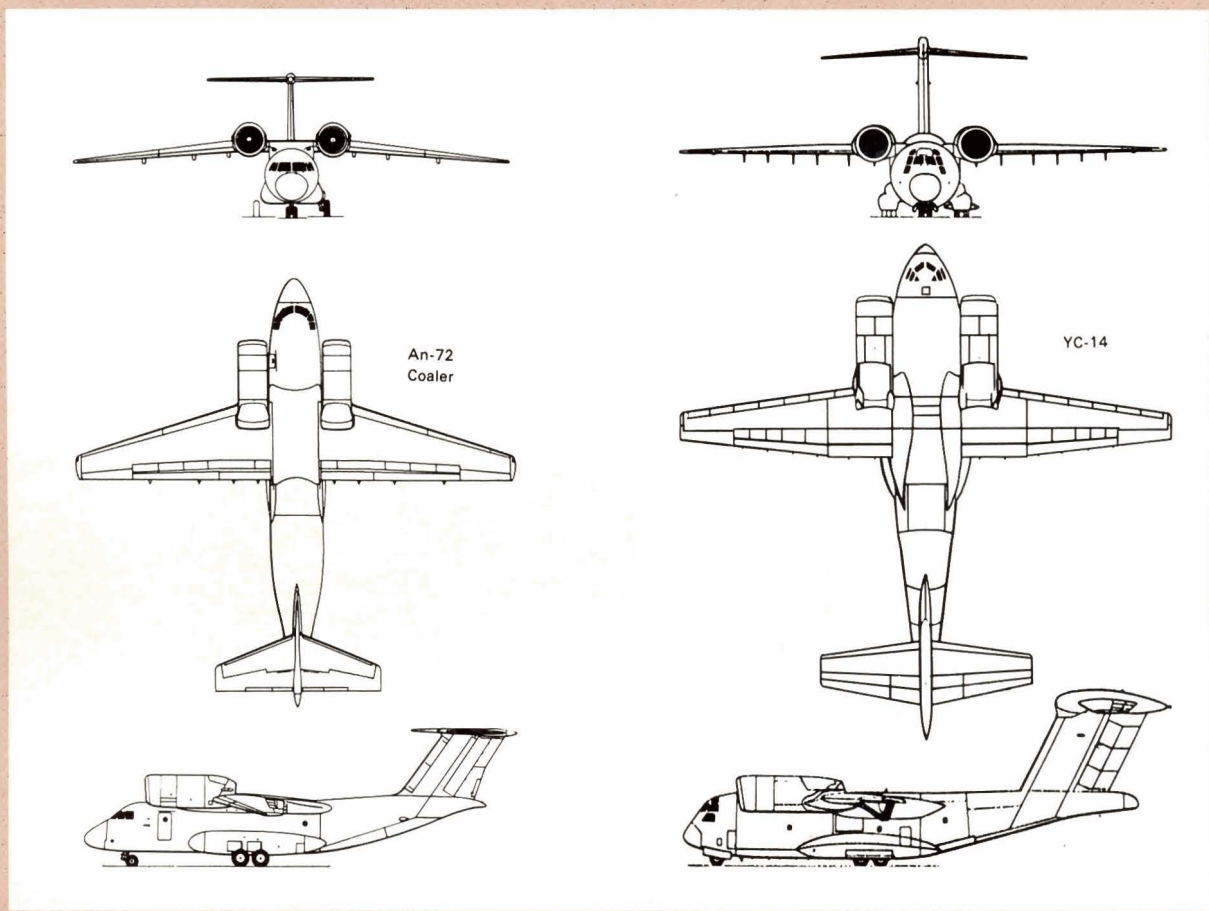
This variable-wing bomber, formerly known as the Ram-P, is expected to become operational in 1986. The aircraft will be powered by new turbofan engines and have the capability for low-level ordnance delivery. It is larger and faster than the B-1 bomber.

An-400 Condor (Fall 1983, Page 55)

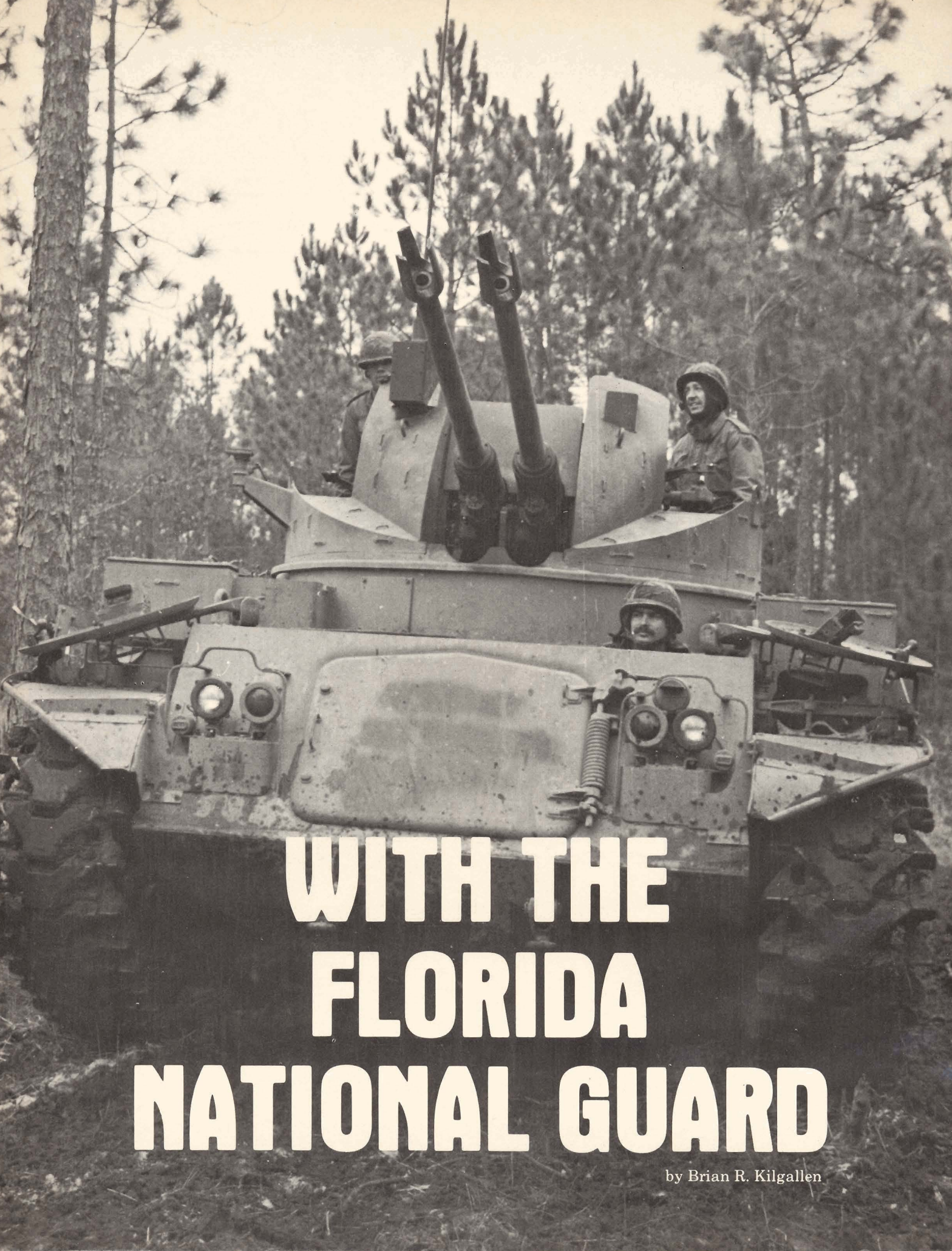


The expected operational date of this transport aircraft is 1986. The plane has a 243-foot wingspan, a range of 2,850 miles and is thought to be five percent bigger than the C-5A Galaxy. It is estimated that the Condor could carry 200 fully equipped infantrymen. This four-engine giant also is thought to be capable of airlifting SS-20 missiles to forward positions.

An-72 Coaler (Spring 1983, Page 58)



This medium STOL transport plane is compared to Boeing's YC-14. It is believed that the aircraft can carry 32 infantrymen or paratroopers with complete gear or 24 stretchers plus one medic. No deployment date is known. ✱



WITH THE FLORIDA NATIONAL GUARD

by Brian R. Kilgallen

Camp Blanding in the northernmost part of Florida seems farther from the Jacksonville beaches than the 30-odd miles it is. The camp is situated well inland where the palm trees associated with the Florida coasts yield to scrub pines and pin oaks. Once a major Active Army training installation, the base was turned over to the Reserves after World War II. Today, National Guard units from all over the state conduct exercises there on a year-round, rotating basis. For one thing, Camp Blanding offers vast acres of ranges and forests that seem to fade to infinity and while the training areas are limited, they can easily accommodate any weapon system in the Guard's inventory, from the M-60 tank to the M-42 "Duster."

It was January when the 1st Battalion, 265th Air Defense Artillery, whose batteries are spread across the state from West Palm Beach in the south to Palatka in the north, arrived for a weekend of training.

SGM Joseph L. Calkins explained that the trek to Jacksonville could take up to six hours for the most distant units. "We're limited by the top speed of our slowest vehicle. The fuel trucks can only do about 45 mph. What it really boils down to is one full day of firing and training on Saturday before we have to turn around and head back."

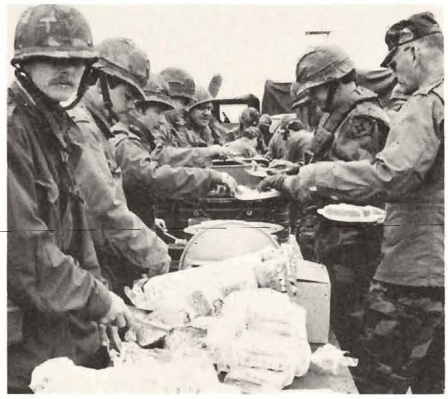
Saturday morning was shrouded in dense fog, and it was cold for Florida. Dusters were lined up by battery along the rise, their 40mm guns aimed vaguely downrange. LTC James Irwin, the battalion commander, looked out toward one of Battery B's tents where some of the soldiers were assembling, his expression conveying his disappointment with the weather.

"The Duster is an old system," he said candidly. "Consequently, most of our problems center on getting replacement parts. And the ammunition, though it's 40mm, is no longer standard." It wasn't a complaint; just a statement. This would be his last drill. He was being reassigned to the National Guard Bureau in Washington, D.C.

Irwin was not the only one who was leaving the 1/265 ADA. MAJ William Dewson, the airspace management operations officer and a close friend of Irwin's, would be retiring shortly. "We go back a long way," he said. "Twenty-five years." There was a pause, a silence that in an instant spanned the decades.

Some of the guardsmen regarded Irwin's departure as the loss of a patriarch. "We're really a family," someone remarked. "These are more than exercises; they are meetings of the clan."

It's that close relationship that one notices immediately about the Guard. In a sense, it's not unlike the camaraderie demonstrated by the military in, say, a British regiment where soldiers can, and often do, remain with the same unit throughout their careers.



Each battery in the 1/265 ADA has its own mess facilities in the field. Here, Battery A serves up the all-American favorite, hot dogs and beans, just the thing for a cold, damp Saturday afternoon.

The esprit is evident in the 1/265 ADA even with the obvious problems that it encounters almost routinely. The battalion recognizes that it is the recipient of hand-me-down equipment. A few of the officers are wearing BDUs. Many are still wearing fatigues, "steel pots" or baseball caps. The most up-to-date weapon in the battalion's inventory is the M-16 rifle. But that isn't what offends them. It's the attitude that some Active Army personnel have toward the Guard. At an air defense artillery conference last year, one of the speakers remarked, "I know you guys like Dusters. I like Dusters, too. I liked my mother, but she's dead." Comments like that tend to place a wedge between the Guard and the Active Army.

Guardsmen have long suffered the slings and arrows of civilians and military alike. There are still a few people in the Active Army who think of the Guard as a poor relative. Its image has not been helped by films like "First Blood" and "Southern Comfort" wherein the National Guard was made to appear inept, untrained and undisciplined.

Fortunately, that view is changing. The emphasis today is on the integration of Reserve Components with the Active Army, what the Army calls the total force concept. Part of that concept

Air defenders in the Florida National Guard learn to protect themselves against nuclear, biological and chemical attack. The soldier on the left in civilian clothes is a new recruit on his first exercise with the Guard. It may take anywhere from six weeks to two months before he will receive his uniform.

Looking like phantoms in the fog, air defenders prepare their Dusters for live-fire training. At 11 a.m., inclement weather forced a cancellation of the firing.

An air defender prepares to release a radio-controlled target drone during a training exercise at Camp Blanding near Jacksonville, Fla.

LTG Charles P. Graham (left), commander of 2nd U.S. Army, discusses training with LTC James Irwin (center) and LTC James Calloway. Calloway later assumed command of the 1/265 ADA after Irwin was reassigned to the National Guard Bureau in Washington, D.C.

Guardsmen from the 1/265 ADA camouflage a Duster in a tactical position at Camp Blanding, Florida.

MAJ Doug Evaul, battalion S-3, briefs LTG Charles P. Graham, commander of 2nd U.S. Army.

calls for the upgrading of the Guard's inventory.

"We're supposed to get Chaparral next year," said Irwin. "In a way, it's a mixed blessing. We've already been told that the ranges here aren't large enough to handle that weapon system, which means we may have to look elsewhere for a place to train."

Battery C at Fort Pierce has just such an auxiliary training area. A former member of the 1/265 ADA who lives nearby donated a portion of his land to the battery for its own use. The other batteries are not as fortunate. Because the Dusters are maintained at Camp Blanding and drawn only when the battalion arrives at the start of the training weekend, personnel at home stations usually spend a good portion of their duty time at the motor pool pulling maintenance on vehicles and equipment.

At 10 a.m., the fog began to lift, then settled again, enveloping the tree line in the distance. "It'll clear by noon," one air defender remarked confidently. "What time's the general arriving?"

The general he was referring to was LTG Charles P. Graham, commander of 2nd U.S. Army, who journeyed from Fort Gillem, Ga., to observe the 1/265 ADA in action.

Complications for the firing set in early. The fog showed no sign of lifting and, in fact, seemed to be getting worse. The evac helicopter was socked-in at Jacksonville—the same helicopter that was suppose to "sweep" the range to ensure that no campers or sportsmen were in the area. The firing was cancelled only moments before Graham's arrival.

MAJ Doug Evaul briefed him on the situation.

"So you can't fire," said Graham. "What kind of training are you doing in its place? Have you thought about conducting an evacuation exercise?"

"The helicopter can't take off from Jacksonville."

"That's a lesson in itself," said the general. "In hostile situations, there are going to be times when you won't have a helicopter at your disposal. Then what do you do? Evacuate by land." He smiled. "It's something you could work on."

Evaul filled him in on other aspects of their training, their strong points, weaknesses and problem areas.

"We're getting back to basics where training is concerned," he said. "So, we're emphasizing the common tasks with our people. Map reading. First aid. Aircraft recognition. Protection against an NBC attack."

Watching the 1/265 ADA in action, one immediately forgets that CPT Charles Craig, the range safety officer, is the director of admissions at Seminole Community College, or that MAJ William Dewson is actually a corporal with the sheriff's department at Fort Pierce. When the battalion comes together, the personnel are as dedicaded as any air defender in the Active Army, and they attack their roles with verve and enthusiasm.

"We have CAPSTONE responsibilities to the 42nd Infantry Division in New York," Calkins said later. "We also stay in close contact with our 'sister' unit, the 1st Battalion, 3rd Air Defense Artillery, at Fort Campbell, Ky. If we had to mobilize tomorrow, that's where we'd go. Both the 1/3 ADA and the Air Defense Artillery School have been very supportive."

Even with that support, however, the battalion sometimes has difficulty in obtaining certain items because, by its very nature, it lies outside the usual Army supply channels. Often the batteries must rely on the school for the latest soldier's manuals, trainer's guides and job books.

Calkins, like many of his fellow guardsmen, talked about the weapons they are slated to receive in the future, weapons such as Chaparral, Stinger and Vulcan. Some of the systems, like Chaparral, may be given to them as early as next year. But the fielding of the majority of the air defense weapons, including a tenuous proposal to field the SGT York Gun to the Guard, is more speculative than positive. With the possible exception of Stinger, they are older systems and, though they will be somewhat improved over those currently in the Active Army inventory, they are still considered by many to be hand-me-downs.

There are some in the Guard who hope the decision to replace Duster—or at least augment it—will be in the offing sooner than later. A proven veteran through two major conflicts, it has served the Army well. But its age is beginning to show.

"The Duster is a good weapon system," said Calkins, "but it's not without its faults. Every so often, a round will jam. And last year we had an accident where one of our boys lost an arm because of a mechanical failure. It was a repeat of a similar accident a few years before."

Many agree, especially those in the Guard, that if the Army truly wants a fully integrated force, it will have to place more emphasis on the kind of weaponry and materiel it is giving the Reserve Components. In the meantime, the Guard is doing the best it can with what it has. ✶

Air Base Defense

by COL Domenic P. Rocco Jr.

(Editor's note: The author wishes to thank MAJ Frank Brown III, S-3, 108th Air Defense Artillery Brigade, and MAJ Suzie Fox, Air Traffic Control, U.S. Air Force, Europe, for their technical assistance in the preparation of this article.)

Today, in the Federal Republic of Germany, short-range air defense of U.S. air bases is provided by the 32nd Army Air Defense Command's 108th Air Defense Artillery Brigade. Throughout the Army, it is the only air defense brigade that has air base defense as its primary mission. The brigade has three Chaparral/Vulcan battalions. The 6th Battalion, 56th Air Defense Artillery, and the 2nd Battalion, 60th Air Defense Artillery, both have air base defense as a primary mission. The 2nd Battalion, 67th Air Defense Artillery, is a divisional battalion with a divisional mission. More than 1,500 of the brigade's soldiers protect Air Force bases where F-4, R-F4, F-15 and F-16 aircraft are stationed. Also included in this defense are the aircraft directly supporting the Commander in Chief, U.S. Air Forces, Europe.

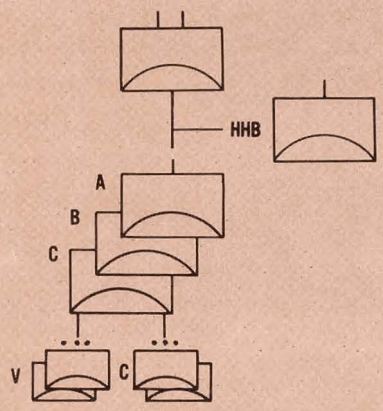
Currently, there is no written tactical doctrine to assist the 108th ADA Brigade in performing this most complicated and complex mission. Not only is the role unique to air defense artillery units, but it also involves the crossing of service boundaries that so often complicate the coordination necessary for success. Therefore, this article is written to provide assistance—doctrine, if you will—for those who may someday assume the responsibility of defending national assets on air bases anywhere in the world.

Air Base Vulnerability

The role of the U.S. Air Force and air power, both as a deterrent to war and as a weapon of war, has grown tremendously in recent years. Air power in World War II, the Korean War and the Vietnam War pales when compared to the awesome capabilities now available to the battlefield commander. Modern high-performance aircraft can deliver nuclear, chemical and conventional munitions with greater precision and a higher volume of firepower than in any conflict to date. This awesome capability, however, is not without its restrictions. Air Force air bases must conduct coordinated aircraft launch and recovery operations. Maintenance and command facilities capable of sustaining these operations are also required. The number of air bases is limited in any theater, and the sophistication of support equipment housed on the air bases grows daily. If not provided dedicated air defense, these bases could quite easily be put out of action by enemy air attacks.

Unlike the Navy's aircraft carriers, Air Force bases cannot move. They are impossible to hide and are lucrative targets for enemy air strikes. To protect the U.S. air bases in the Central Region (Germany), air defenses are constructed in layers designed to thwart potential enemy air attacks. At the onset of hostilities, enemy aircraft will attack air defenses to eliminate friendly air power and achieve air superiority. Effective use of air defense sys-

6/56 ADA AND 2/60 ADA ORGANIZATION



Each battalion is organized with three firing batteries. Each battery has two Vulcan platoons and two Chaparral platoons for a total of eight Vulcan and eight Chaparral systems.

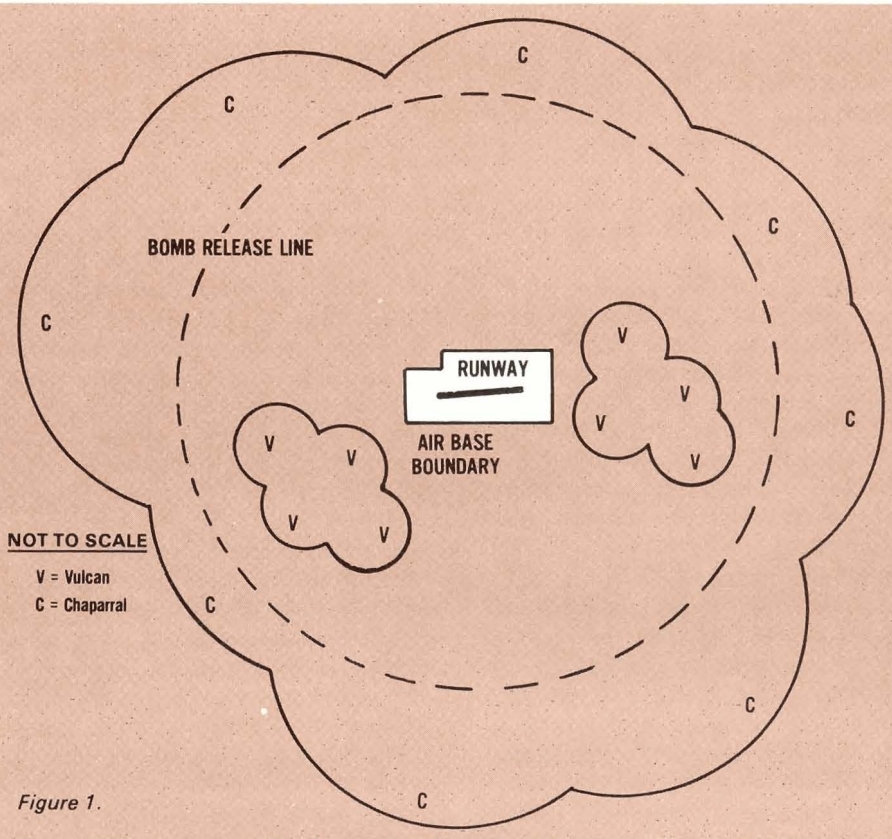


Figure 1.

Chaparral systems are deployed away from the air base in order to engage attacking aircraft before they reach the bomb release line. Vulcans are deployed as gap fillers and to add defense in depth.

tems, such as Patriot and Hawk, will blunt the worst effects of enemy strikes in the high-, medium- and low-altitude layer of the air battle. However, the air bases will always remain vulnerable to low-flying, terrain-hugging aircraft operating below the Hawk umbrella. Thus, when all other defense systems have fallen short and enemy aircraft are zeroed in on the air base, one final means of defense remains, the Army's dedicated SHORAD systems: Chaparral, Vulcan and Redeye/Stinger.

Air Base Defense Organization

Air base defense by SHORAD is an excellent example of joint service operations in an incredibly complex system of U.S. and Allied air forces and ground-based air defense operations. To provide the best possible SHORAD coverage, each of the two battalions assigned air base defense is organized with three composite firing batteries. Each firing battery consists of two Chaparral platoons and two Vulcan platoons for a total of eight Chaparral and eight towed Vulcan systems. This organization gives the battery commander the best possible mix of air defense without requiring the battalion commander to task organize across battery lines. A typical defense is shown in Figure 1.

Chaparral and Vulcan systems deploy as far from the air base edge as possible to identify and engage enemy aircraft before they reach their postulated bomb release line. Chaparral, and its supplementary Redeye or Stinger weapon systems, can cope with this requirement and effectively counter enemy aircraft releasing ordnance at this distance while allowing no gaps in the coverage. Vulcan systems are deployed to defend primary approaches to the air base and to add depth to the Chaparral defense. Mutual support may have to be sacrificed in some cases due to difficult terrain and the size of the defended bases.

Since SHORAD weapons employed in air base defense will be as potentially lethal to friendly as well as enemy aircraft, the locations and operational envelopes of friendly aircraft must be considered. To the SHORAD gunner on the ground, all aircraft will be seeking the base as a safe haven or as a target. It is the commander's responsibility to recognize this potentially complex mix of friendlies and hostiles and to develop with the air base wing commander a means to reduce the risk to friendly aircraft without severely restricting SHORAD fires.

Although the Army air defense commander has the responsibility for command and design of the defense, air raid warnings and weapons control orders authority of his unit rest with the supported Air Force wing commander. But priorities of defense, withdrawal of forces, reconstitution, positioning, engagement and movement authority and technical support still rest with the Army commander. This unique situation is not normally faced by other SHORAD units and involves a high degree of preplanning and coordination.

Command and Control

The 108th ADA Brigade uses a modified version of the manual SHORAD control system as a frame of reference in dealing with the problem of sorting the friendlies from the hostiles. The system was selected because it has been proven as an effective method to manually track and report time-sensitive aircraft position data. This common frame of reference permits early warning data to be obtained from any of the on-base air traffic control radars. Currently, the method of transmitting early warning to 108th ADA Brigade fire units begins at the defended base's radar approach control/air traffic control radar facility. At all defended U.S. air bases, an Air Force air traffic controller, dedicated solely to Army SHORAD, broadcasts aircraft position data for both friendly and unknown aircraft directly to the SHORAD fire units via an FM early warning net. The radios for this net are on loan from each battery to its supported air base. The Air Force currently is working to obtain its own compatible radios which will release the Army radios for their intended purposes. The FAAR and battery command post also monitor this net.

The benefit of using the approach radar for early warning is that its range in excess of 50 miles enhances the relatively short range of the FAAR. Additionally, the air traffic controllers are in constant voice communications with other friendly aircraft that may

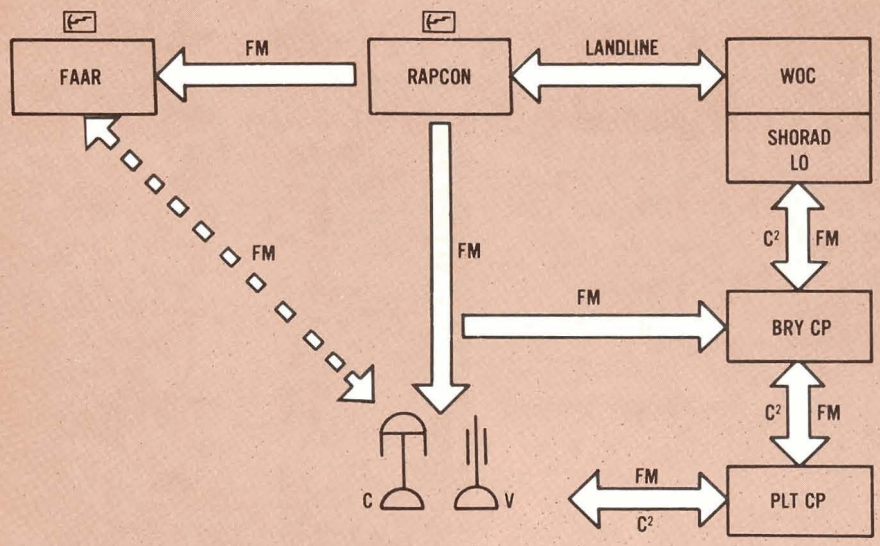


Figure 2.

The early warning is broadcast from the radar approach control facility directly to each fire unit, the FAAR and the battery command post via the early warning FM net. The normal command and control data is passed from the SHORAD liaison officer through the battery and platoon command posts to the fire units.

not be detected by either radar. This information is transmitted to the fire units using the manual SHORAD control system's grid matrix. The standard grid has been expanded to cover simultaneously all Central Region defended air bases, thus giving the entire geographical area a common frame of reference. Fire units from one base can monitor the transmission of an adjacent defended base, thus providing an inherent redundancy.

The organic FAAR also monitors the early warning frequency and searches in the alerted sector. Once the FAAR acquires the target, the data is transmitted via FM data link directly to the target alert data display set at the fire unit. Because of the FAAR's much shorter range, the radar approach control/air traffic control is able to give the FAAR a "heads up" on all approaching aircraft. In addition, the battery command post also is monitoring and can relay, through the platoon command post to the fire unit, the same information for those units that do not have FM line-of-sight with the radar approach control/air traffic control or FAAR. While this system does not guarantee that all aircraft will be detected, it does greatly increase the battalion and battery capability to detect and identify aircraft.

Although there may be Army Hawk units in the vicinity of the SHORAD batteries, early warning obtained from the radar approach control/air traffic control is preferable to Hawk early warning data for the following reasons:

- Early warning is localized for each specific air base.
- The radar approach control/air traffic control facility has voice communications with friendly aircraft and can still report their positions in the event of a radar outage.
- Air base SHORAD units do not have authorized personnel or equipment to perform a Hawk liaison function.
- Most Hawk command and control facilities are already crowded. The addition of a SHORAD liaison officer, NCO and radio would only complicate the situation.

The SHORAD liaison officer in the wing operations center is in direct contact with the supporting battery's command post and the wing commander. His specific duties will be outlined later. The radar approach control/air traffic control facility and the wing operations center are connected by landline communications. A close-up view of how early warning information is passed using the manual SHORAD control system is shown in Figure 3.

Base Defense Operations

Another problem to consider is the method of getting friendly aircraft into or out of the base defense zone with enemy aircraft attacking or operating in close proximity. Under the concept developed by the 108th ADA Brigade, each air base has partitioned its base defense zone into sectors for easy identification of operational areas. Traditionally, the entire base defense zone would be declared weapons tight* to allow for the emergency launch or recovery of friendly aircraft.

Although this approach gives increased protection for friendly aircraft, it also forces the SHORAD fire units to unnecessarily degrade their weapon system's capability and thus their defense in those areas where there are no friendly aircraft. Since the fire unit must make positive visual identification during weapons tight, maximum protection is given to the aircraft.

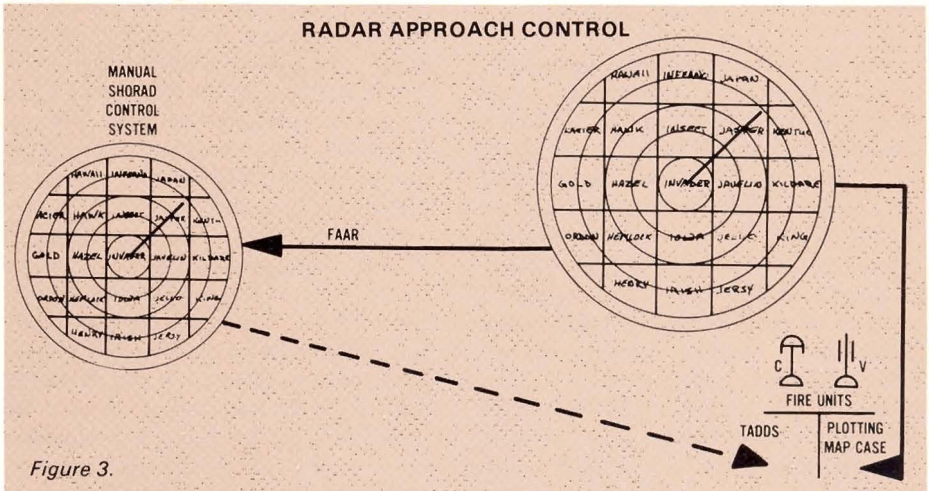


Figure 3.

The early warning message is transmitted via FM radio from the radar approach control facility directly to the fire unit. The fire unit plots the information on its plotting mapcase, which depicts the same 10-by-10 kilometer grids that are on the radar approach control radar display. The FAAR also monitors the early warning net and sends the automatic data link to the target alert data display set located at each fire unit.

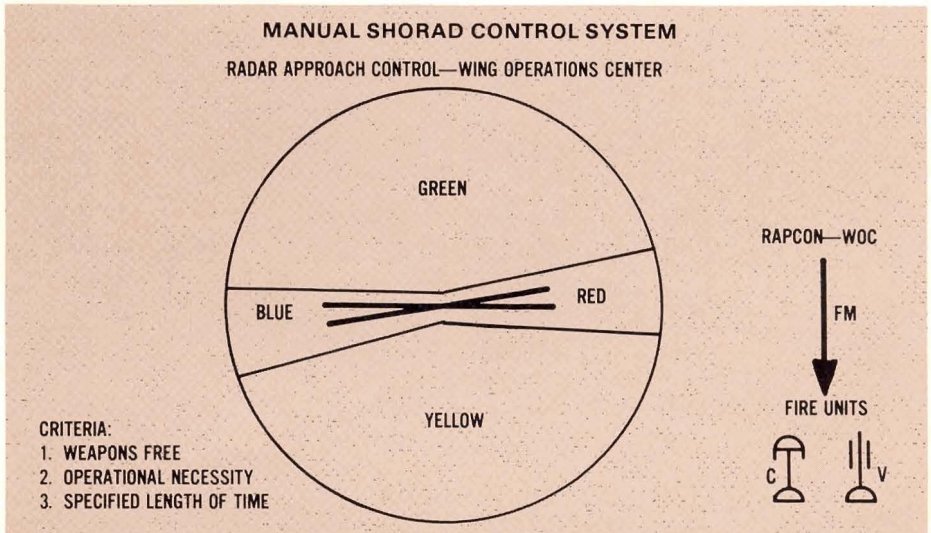


Figure 4. **Base defense zone safe lane procedures**

Whenever the base defense zone is at weapons free, radar approach control can declare one or more sectors as weapons tight to handle emergency aircraft launches and recoveries. The information is passed directly to each fire unit via the early warning FM net.

Weapons hold: Weapons will not fire except in self-defense.

**Weapons tight:* Weapons may fire only at aircraft positively identified as hostile.

Weapons free: Weapons may fire at any aircraft not positively identified as friendly.

However, the requirement for visual identification also limits early engagement to approximately three kilometers, the average range a crewman can visually identify a target. Using the sector or safe lane method, the wing commander can now provide the same degree of safety for his aircraft while concurrently maximizing the SHORAD capabilities in any unaffected area of the base defense zone. For example, if a friendly aircraft must fly through Sector Red while SHORAD weapons in that sector are at weapons free, Sector Red can be rendered weapons tight while the remaining sectors remain at weapons free. Depending on the situation, any combination of sectors can be placed at weapons tight.

The speeds of today's aircraft dictate that directives changing the weapons control order of any sector be passed as quickly as possible. Whenever the entire base defense zone has been declared weapons free by the wing commander, the order declaring a particular sector weapons tight is passed from the radar approach control/air traffic control facility directly to the fire units via the FM early warning net. Before this information is passed on, however, the controller must ensure that an operational necessity or tactical need exists to launch or recover aircraft. He may exercise this authority only for the specified length of time to handle the emergency or contingency. At all other times when the base defense zone is not at weapons free, the normal command and control from the wing through the SHORAD liaison officer to the battery command post will be used. Once a sector is no longer needed or required to be at weapons tight, the radar approach control/air traffic control will place a net call to the fire units directing that Sector Red, for example, is again weapons free. The radar approach control/air traffic control facility may only temporarily restrict the weapons control order for the time required to handle the contingency, once the wing commander has declared the base defense zone weapons free. The controller may never make the weapons control order less restrictive, only more restrictive.

To maintain control and to ensure that the wing commander is informed of the current situation in the various sectors of the base defense zone, a status board similar to the one shown in Figure 6 is used. As a minimum, status boards should be located in the wing operations center, the radar approach control facility, the control tower and any other agency directed by the wing commander.

The top portion of the status board indicates the overall base defense zone weapons control orders and SHORAD air raid warning. This portion is controlled by the wing commander in the wing operations center. The bottom

MODIFIED MANUAL SHORAD CONTROL SYSTEM

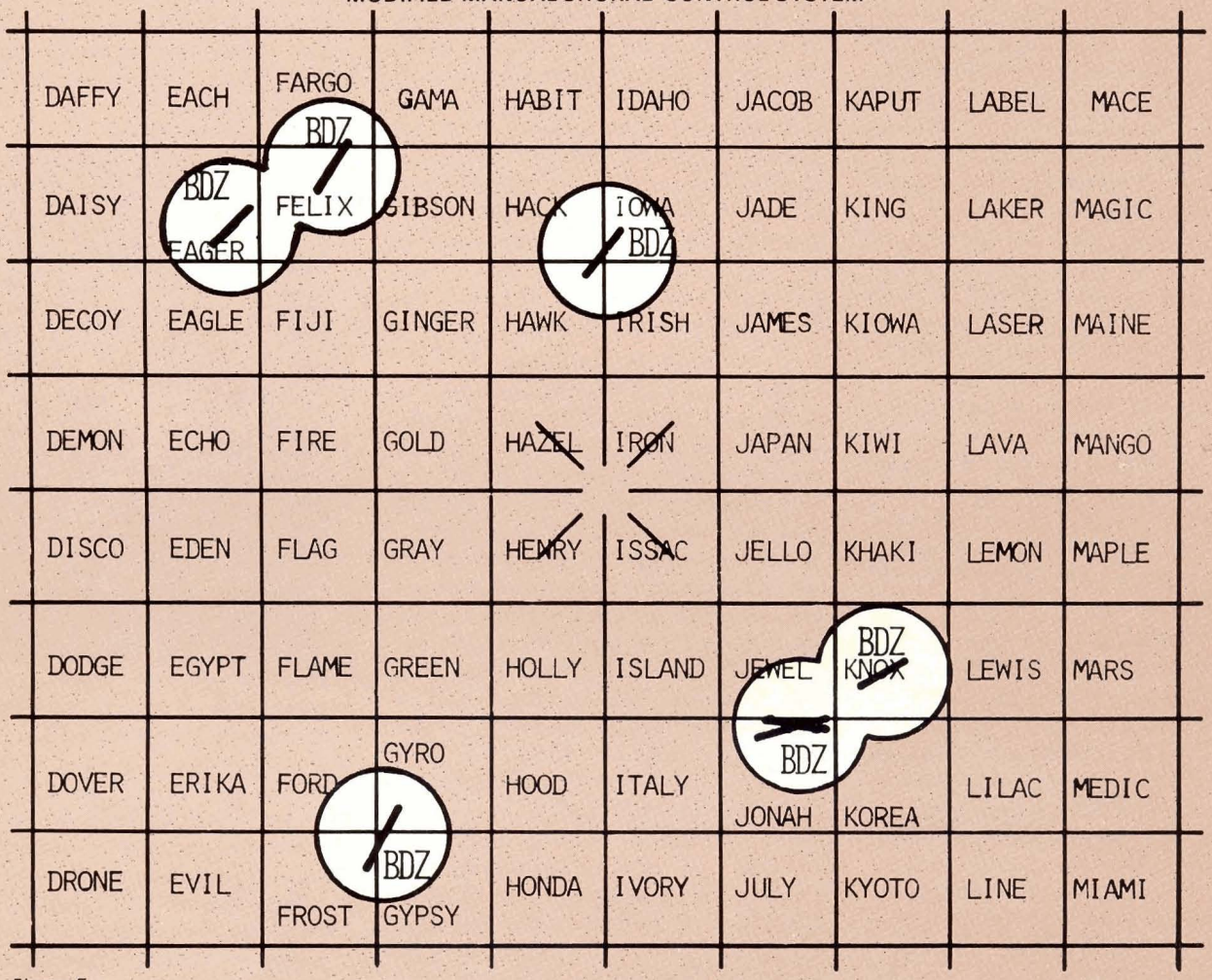


Figure 5.

Each of the six air bases and their base defense zones have been covered by the expanded 10-by-10 kilometer grid matrix.

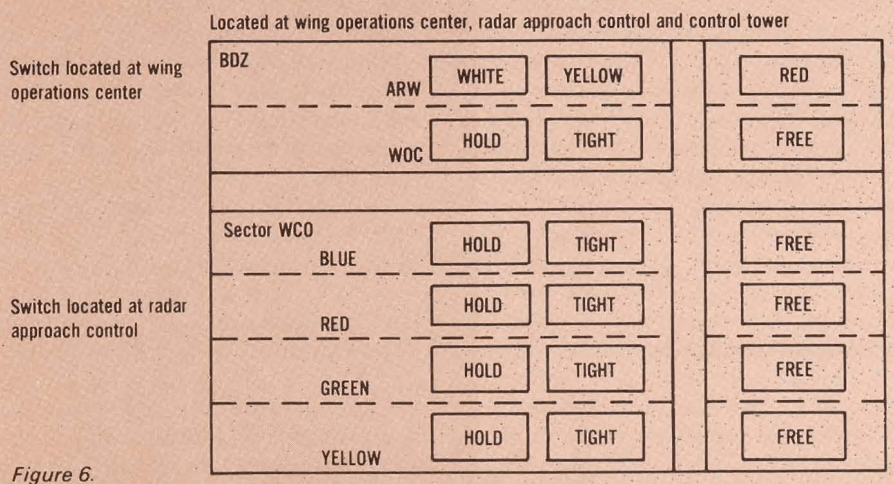


Figure 6.

The wing operations center (WOC) controls the overall weapons control orders (WCO) and the air raid warnings (ARW) for the base defense zone (BDZ). The radar approach control can control each separate sector when the base defense zone has been declared weapons free by the wing operations center. The wing commander always has override authority.

portion would not be used except in those conditions where the entire base defense zone is at weapons free. Once the base defense zone is declared weapons free, and the radar approach control/air traffic control facility exercises its option to declare a specific sector—for example, Sector Red as weapons tight—the controller activates a switch which causes weapons tight to light up in Sector Red.

Once the emergency is over, the controller reverses the switch, taking Sector Red back to weapons free. The wing commander reserves the authority to override at any time and not allow a particular sector to change status. As long as the base defense zone is not at weapons free, the individual sectors are not controlled by the radar approach control/air traffic control facility. In all cases, only the wing commander can establish the weapons control order for the overall base defense zone.

SHORAD Liaison Team

Each supporting SHORAD battery currently stations a wing liaison officer and team inside the wing operations center. The liaison team's primary mission is to interface directly between the supporting battery commander and the wing commander. Although there are no authorized modified table of organization and equipment positions for the team at the present time, the importance of exchanging command and control information as well as intelligence data is so great that personnel and equipment had to be made available for this requirement. The liaison officer is typically the battery maintenance officer who has an NCO assistant. Since the defending battery is deployed off the base and will not be able to provide the liaison team with necessary logistical and administrative support, existing agreements require each wing to support the liaison teams. Without the wing liaison team, the battery commander would be relegated to this duty and lose much of his ability to command and control his Chaparral and Vulcan fire units defending the base.

Last Defense Line

The mission of the U.S. Air Force is to fly and fight. For the air defense commander, this involves dealing with the complex mix of aircraft launching and returning to the air base as quickly and safely as possible. The wing commander has little or no time to concern himself with mix, mass or threat ordering. His main concern will always be combat sortie generation. Therefore, all facilities on his base must and will be made available for this. The SHORAD elements defending an air base must recognize that aircraft will operate continuously from the base, departing in tactical formations, returning with battle damage and flying unusual and often unpredictable maneuvers. In areas such as the Central Region, poor weather and visibility, along with the myriad of existing identification, friend or foe, problems, contribute to the complicated task of identifying friendly aircraft and accommodating all aircraft operations.

The 108th ADA Brigade has endeavored to solve this multifaceted problem through a series of procedures designed around the flying mission of the wings and the Army's air defense requirements of the bases. There is a delicate balance between these two missions, but they are far from mutually exclusive. The key is first to understand the missions, then integrate the air base defense design into wing combat operations, taking advantage of the many resources and varied capabilities available on the base. The air base defense role is unique, and the Air Force depends on us to ensure the survivability of the base so that they can generate the combat sorties required to accomplish their mission.

Every soldier involved in the defense of an air base realizes that an enemy aircraft must run the gauntlet of Air Force interceptors and longer-range Army air defense systems before it is likely to reach his SHORAD position. But he also realizes that there are no defenses behind him. He is the final hope in defeating an enemy air attack. He is, indeed, the last line of defense. ✶

COL Domenic P. Rocco Jr. *was commander of the 108th Air Defense Artillery Brigade until March 1, 1984, when he became the inspector general of U.S. Army, Europe and 7th Army. A graduate of the U.S. Army War College and the U.S. Army Command and General Staff College, he holds a bachelor's degree from the University of Nebraska at Omaha and a master's degree in public administration from Shippensburg State College, Pa.*

The 9th Infantry DIVADA Story

The 9th Infantry DIVADA has spent the past three years as Air Defense Artillery's point unit. In partnership with the 9th Infantry Division (Motorized) and the U.S. Army Development and Employment Agency, the Fort Lewis, Wash., air defenders have experimented with innovative technologies, new strategies and weapon prototypes to provide air defense for light divisions on the air-land battlefield. The results of their reconnaissance work into light air defense are highlighted in the following pages.

Air Defense Artillery And ADEA: Partnership For Innovation

by MAJ Clyde Simmons

The enemy learned of the 9th Infantry Division's (Motorized) arrival on the large airfield almost as soon as the first C-130 had unloaded its cargo of infantry and high-mobility, multipurpose, wheeled-vehicle squad carriers. The enemy ordered an immediate air strike to destroy the ever-increasing lodgement force and its vital link with the outside world, the airfield runways.

However, the enemy commanders could not obtain the necessary political approval required to launch a counterattack until almost 14 hours after the 9th Division arrived in the host nation. Preparing the strike plans, briefing aircrews, fueling and arming further delayed the strike. It was almost 24 hours after the lodgement operation began when the first enemy bombers were launched. Still the enemy commanders were confident they could destroy the 9th Division before sufficient air defense assets to counter their air strike could be brought into the lodgement area.

The enemy aircrews expected to meet only light fighter defenses in the target area and minimal ground-based air defense. However, their hopes for a "milk run" began to dissolve when they had traveled less than half the distance to their target. U.S. Air Force F-15s, directed by an E-3A airborne warning and control system aircraft, attacked the bombers almost without warning. In only a few seconds of confused combat, several enemy bombers were destroyed, severely weakening the attacking force. Although the escorting fighters prevented total destruction of the attacking force, the enemy aircrews realized this mission would not be as easy as they had thought.

Dropping low to the ground in an attempt to avoid further attacks by American fighters, the enemy flights continued to the target. However, the same E-3A AWACS which had directed the F-15s to the enemy flight paths alerted the 9th Division's Air Battle Management Operations Center. The automated command and control (C^2) system at the ABMOC instantly alerted all forces in the lodgement area of the impending attack.

The U.S. air defense units in the lodgement area prepared their weapons for action and scanned both the sky and their digital displays. Active and passive sensors began to pick up the approaching enemy aircraft well before they began their climb to attack altitudes and fed this information to the automated C^2 system. Towed Chaparral, Stinger and Light Air Defense System gunners were instantly cued and trained their weapons on the azimuths from which the enemy would come.

In the few seconds before his aircraft was blown apart by high explosive projectiles from a LADS gun, the enemy flight leader was shocked by the high volume of air defense gun and missile fire from the target. How could the Americans have brought in so many air defense weapons by aircraft in such a short time?

After the raiding aircraft had been driven off, the soldiers of the 9th Division assessed the damage caused by the attack. Thanks to the coordinated gun, missile and interceptor defense, friendly losses of equipment, supplies and personnel were light. The enemy air commanders, however, found their losses were heavy and decided future engagements with the 9th Division would not be as simple as they had been led to believe by their intelligence reports.

The soldiers of the 9th Division, having successfully countered the enemy air strike, prepared to move from the lodgement area to contact and engage the enemy ground forces. The light losses incurred during the air strike were due in large measure to recent innovations in small but highly lethal air defense weapons and automated C^2 systems.

This scenario of a successful air defense by a light force operating in a contingency area is not likely, given today's weapons and C^2 equipment. Today's weapons are too large to allow sufficient numbers to be introduced to lodgement areas during the critical early stages of these operations.

Developmental Vanguard

Fielded systems also lack the mobility to keep up with their supported forces and are not lethal enough to guarantee success. Finally, manual C^2 systems are clearly inadequate in coordinating and controlling modern air battles. However, efforts to develop improved weapons, C^2 equipment and new light force air defense artillery structures are underway throughout the Army. At the vanguard of this process is the unique partnership among the Army Development and Employment Agency, the 9th Infantry Division, TRADOC, DARCOM and civilian industry at Fort Lewis, Wash.

The mission of the Army Development and Employment Agency, a field operating agency of the Department of the Army, is to search out innovative technologies and concepts to make light forces more effective in future conflicts. These new technologies and concepts are evaluated and, if proven successful, recommended to the Army for adoption.

All members of the partnership share in the development and evaluation phases through studies, simulations and during realistic field training exercises. Soldiers of the 9th Division are trained to operate the surrogate equipment used to evaluate new concepts and are encouraged to provide feedback to test personnel. This key role of the field soldier in the evaluation process is unique and ensures that user input is fully considered during the developmental process.

All branches participate in this development process and certainly Air Defense Artillery is no exception. The 9th DIVADA is the focal point for innovations concerning air defense artillery for light forces.

Ongoing efforts include new weapon systems and the evaluation of a distributed C^2 system.

New Weapon Prototypes

A replacement for the current M-167A1 Vulcan cannon is a key item of

Senior Air Defense Artillery Commanders

GERMANY

MG Victor J. Hugo
32nd AADCOM

COL Robert J. Weinfurter
10th ADA Bde

LTC Joseph G. Garrett III
1st Bn, 1st ADA (Hawk)

LTC Robert H. Upchurch
2nd Bn, 2nd ADA (Hawk)

COL Wallace C. Arnold
69th ADA Bde

LTC Maurice R. Alexander
3rd Bn, 7th ADA (Hawk)

LTC Stephen J. Kempf
6th Bn, 52nd ADA (Hawk)

LTC John J. O'Connell Jr.
2nd Bn, 57th ADA (Hawk)

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

COL Joe B. Thurston Jr.
94th ADA Bde

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

LTC John P. Rose
3rd Bn, 59th ADA (Hawk)

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

LTC Theodore S. Clements
3rd Bn, 7lst ADA (Herc)

COL Jay M. Garner
108th ADA Bde

LTC Fredrick C. Beauchamp
6th Bn, 56th ADA (C/V)

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

LTC James L. Smith
2nd Bn, 67th ADA (C/V)

LTC James P. Durbin
2nd Bn, 59th ADA (C/V)
1st Armd Div

LTC Richard D. Kline
3rd Bn, 61st ADA (C/V)
3rd Armd Div

LTC Leopoldo R. Vasquez Jr.
3rd Bn, 67th ADA (C/V)
3rd Inf Div

LTC Lowell J. Smith
1st Bn, 59th ADA (C/V)
8th Inf Div

LTC Joe B. Carden
5th USA Arty Group

ITALY

COL Richard J. Galliers
559th USA Arty Group

KOREA

LTC Herbert J. Smith III
2nd Bn, 61st ADA (C/V)
2nd Inf Div

HAWAII

LTC Donald J. Banta
1st Bn, 62nd ADA (C/V)
25th Inf Div

CONUS

LTC Henry A. Nemec
3rd Bn, 68th ADA (Hawk)
XVIII Abn Corps

LTC James L. Frederick
3rd Bn, 4th ADA (V/S)
82nd Abn Div

LTC Joseph B. Berger Jr.
1st Bn, 3rd ADA (V/S)
101st Abn Div (Air Assault)

LTC Gary L. Bridgewater
2nd Bn, 5th ADA (C/V)
2nd Armd Div

LTC William E. Pedigo
1st Bn, 68th ADA (C/V)
1st Cav Div

LTC Neal J. Delisanti
2nd Bn, 51st ADA (Hawk)
1st Inf Div

LTC George J. Martindell
4th Bn, 61st ADA (C/V)
4th Inf Div

LTC Joseph M. Cosumano Jr.
1st Bn, 55th ADA (C/V)
5th Inf Div

LTC David K. Heebner
1st Bn, 51st ADA (C/V)
7th Inf Div

COL Donald M. Lionetti
9th Inf DIVADA

LTC Robert L. Ford
1st Bn, 4th ADA (Hawk)

LTC Lewis J. Goldberg
1st Bn, 67th ADA (C/V)

LTC Eugene P. Semmens
5th Bn, 52nd ADA (C/V)
24th Inf Div

COL Gerald H. Putman
11th ADA Bde

LTC Charles W. Wood
4th Bn, 1st ADA (C/V)

LTC Terry L. DePhillips
1st Bn, 7th ADA (Hawk)

LTC Robert M. Davis
2nd Bn, 55th ADA (Hawk)

LTC William H. Gardner Jr.
1st Bn, 65th ADA (Hawk)

LTC Michael S. Robertson
5th Bn, 200th ADA (Roland)
(NMARNG OPCON)

COL Claude Ellis Jr.
School Brigade

LTC Robert E. Huston
4th Bn, 3rd ADA (Patriot)

LTC David E. Beaman
1st Bn, 43rd ADA (Patriot)

LTC Johnnie O. Rankin
2nd Bn, 43rd ADA (Patriot)

LTC Kenneth C. Sorensen
Allied Student Bn

LTC Howard A. Murray Jr.
Student Bn

LTC Gene L. Miller
Staff & Faculty Bn

COL Richard E. Supinski
1st ADA Tng Bde

LTC Stephen S. MacWillie
2nd Bn (BT)

LTC Peter H. Poessiger
3rd ADA Tng Bn (OSUT)

LTC Donald W. Murray
4th ADA Tng Bn (OSUT)

LTC Alan N. Christensen
1st Instructor Bn (Prov)

NATIONAL GUARD

BG George W. Treadwell
111th ADA Bde, NMARNG

LTC Harold A. Uttley
1st Bn, 200th ADA, NMARNG

LTC Felipe D. Garcia
2nd Bn, 200th ADA, NMARNG

LTC William C. McAdams
3rd Bn, 200th ADA, NMARNG

LTC Reinaldo Sanchez
4th Bn, 200th ADA, NMARNG

LTC William A. Vick
3rd Bn, 111th ADA, VARNG

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

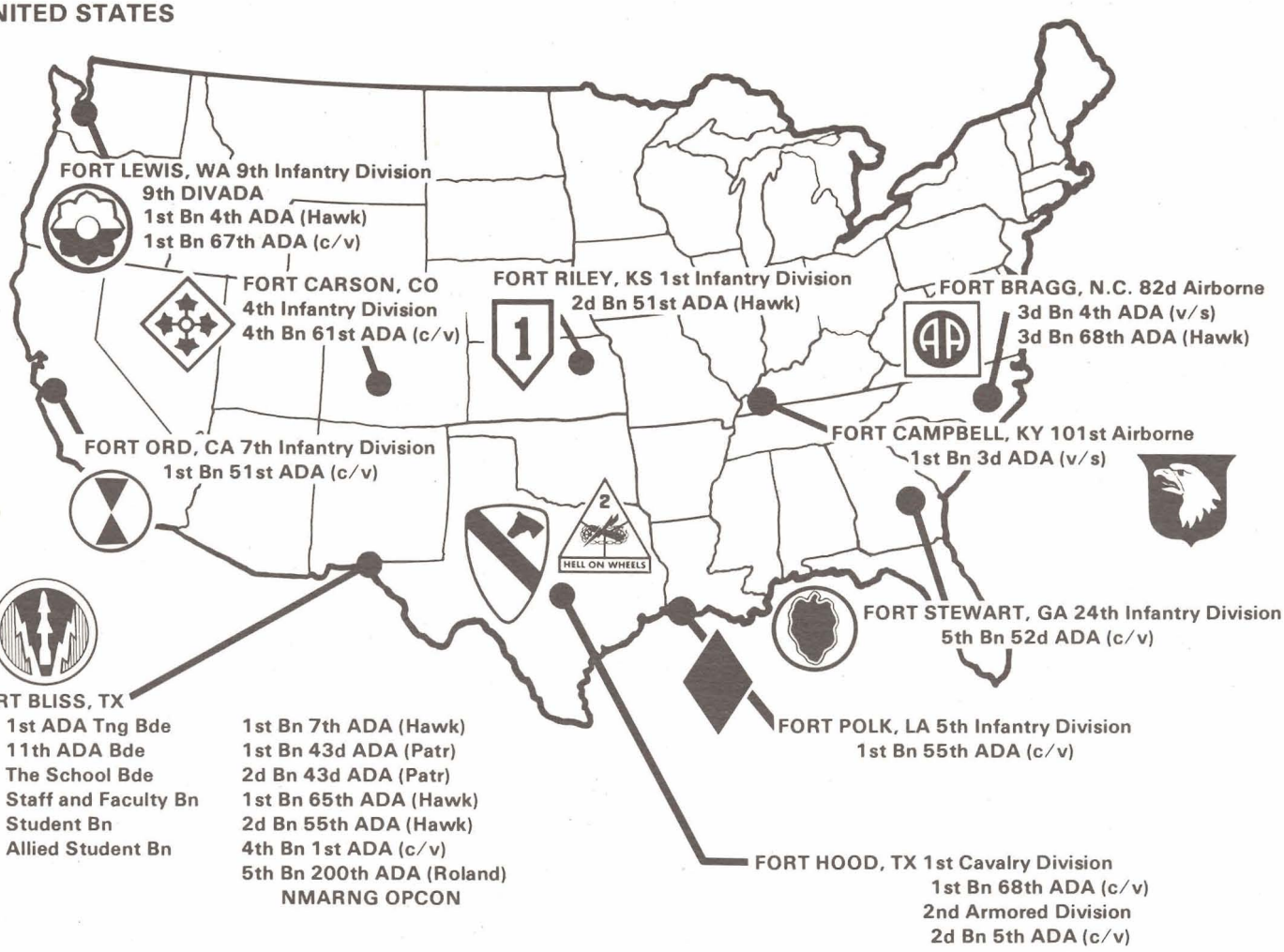
LTC Hoyt E. Thompson
2nd Bn, 263rd ADA, SCARNG

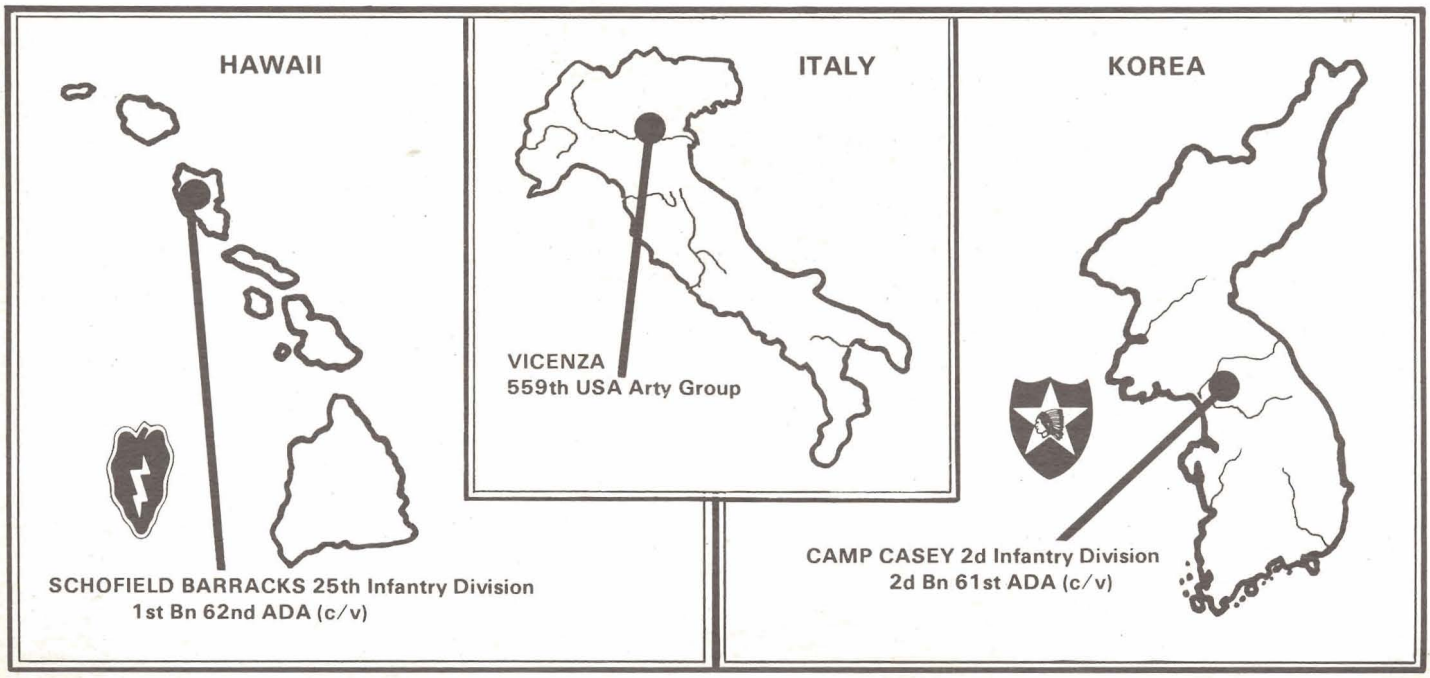
LTC James Calloway
1st Bn, 265th ADA, FLARNG

effective May 31, 1984

AIR DEFENSE ARTILL

UNITED STATES





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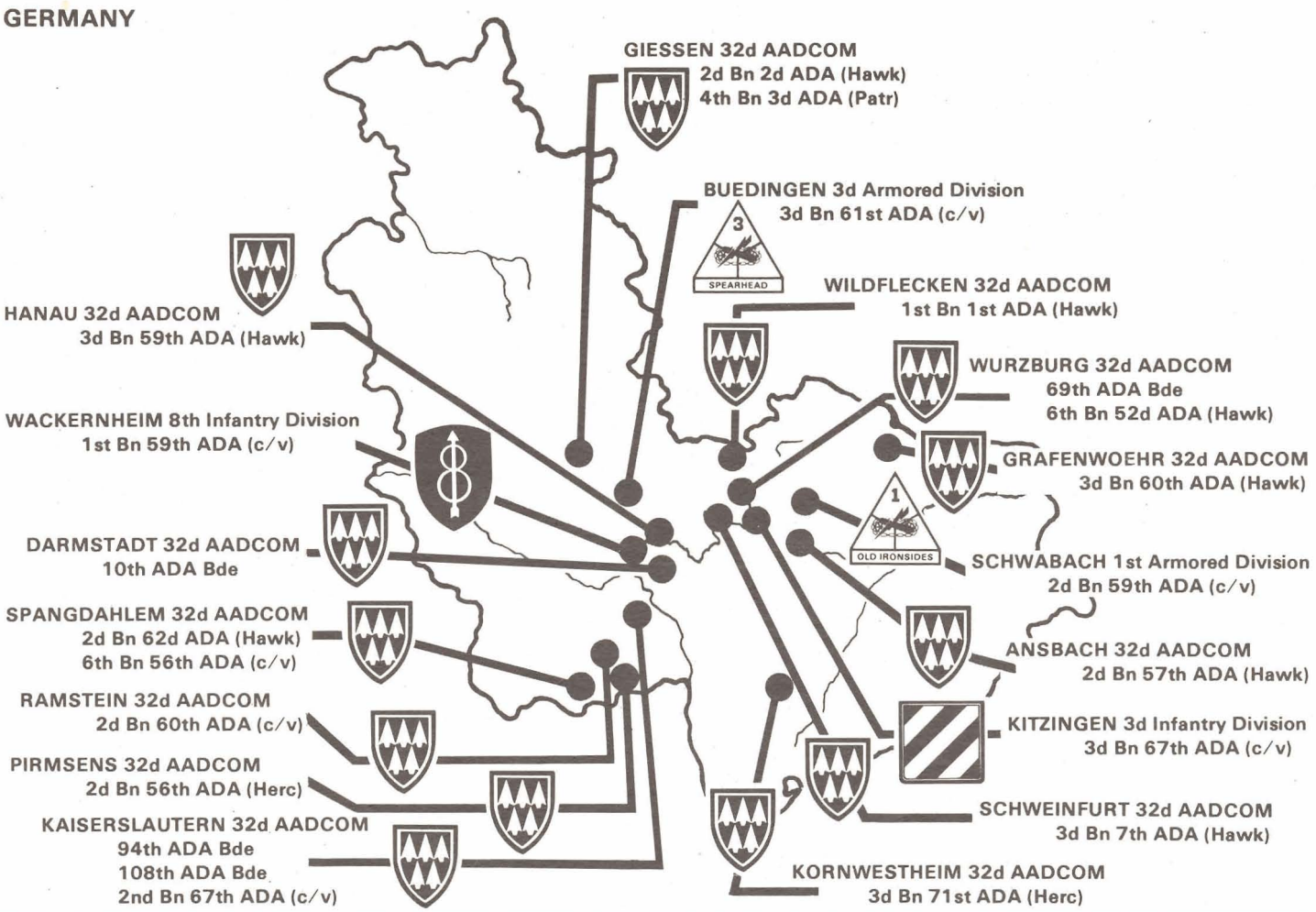
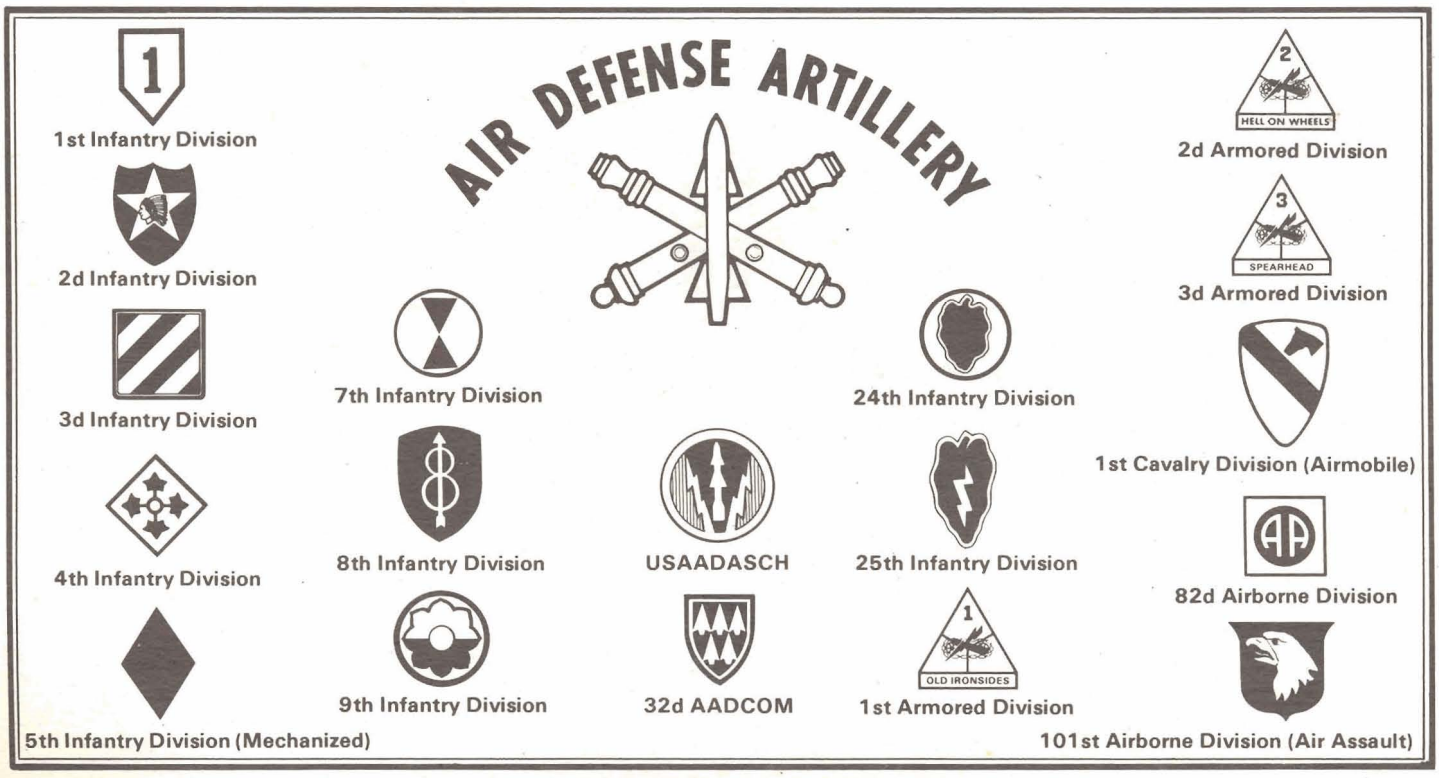
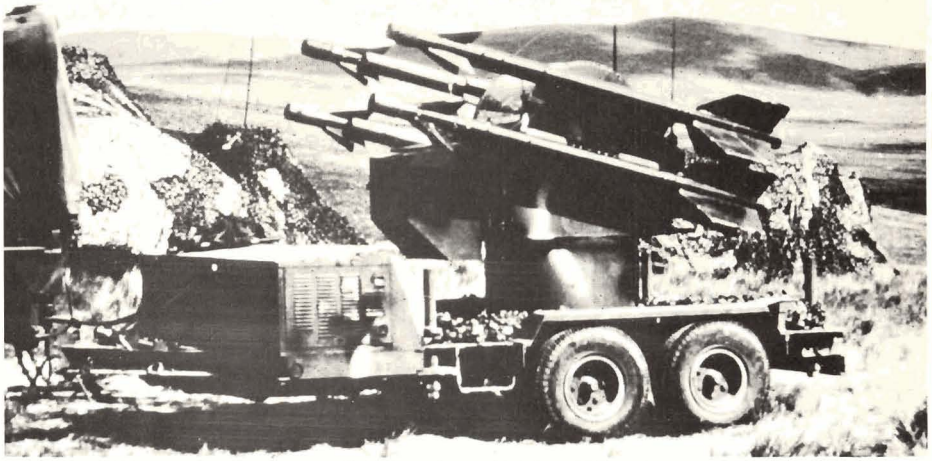




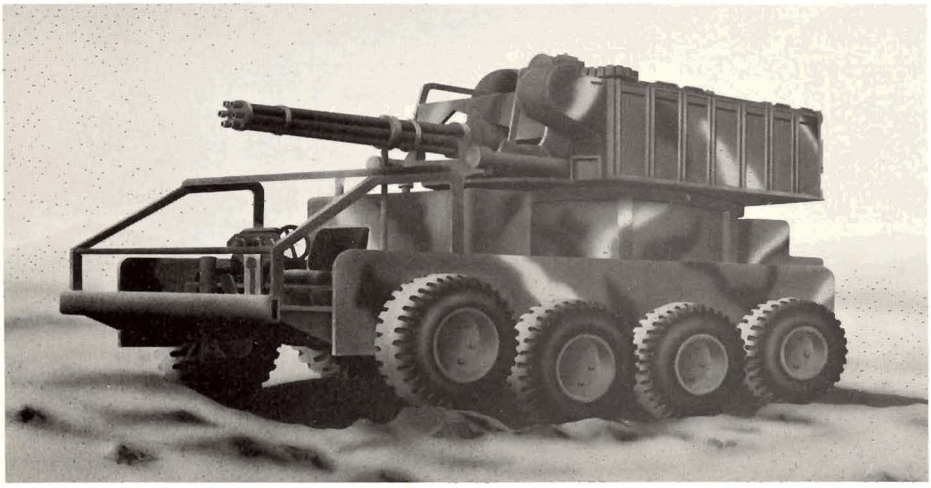
ARTILLERY

interest to the entire Army as well as the 9th Division. The M-167A1 has serious deficiencies in range and lethality and does not have the ground mobility to allow it to keep up with the rapidly maneuvering, motorized infantry of the 9th Division. Representatives from the Army Development and Employment Agency and the 9th Division are participating in the formulation of requirements for the replacement weapon, the LADS. Stated 9th Division requirements for the LADS are a wheeled, self-propelled gun system with a desired range of three to four kilometers, capable of engaging fixed and rotary wing aircraft, light armored vehicles and dismounted troops.



The towed Chaparral en route to a field location at Yakima Firing Center.

The LADS is envisioned to be organic to the direct support battery of the high-tech motorized division air defense artillery battalion and would provide defense primarily for the maneuver units of the division. To further develop user requirements for the LADS, a series of concept evaluations of a surrogate system is planned. The surrogate system is known as the Vulcan wheeled carrier and is being developed by a civilian contractor. This system will mount a modified M-167A1 cannon on an eight-wheeled, hydrostatic drive carrier capable of high speed, cross country movement.



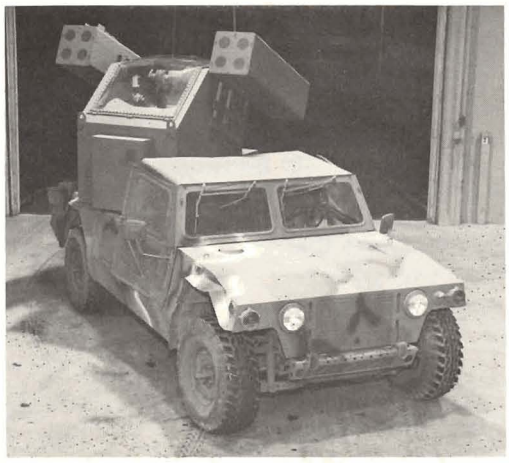
An artist's concept of the Vulcan's eight-wheeled, hydrostatic drive vehicle.

Current plans call for a prototype Vulcan wheeled carrier to be evaluated in May 1984. Further evaluations of a platoon of four Vulcan wheeled carriers are planned for August 1984.

Another surrogate system programmed for concept testing is a multiple-Stinger launcher mounted on the high-mobility, multipurpose, wheeled vehicle. The multiple-Stinger launcher, with its on-board electrical power, cooling gases and improved fire control system, will offer enhanced mobility as well as increased firepower for Stinger teams.

A civilian contractor is fabricating a prototype mounted-Stinger system for Army Development and Employment Agency evaluations scheduled to begin in May. If the mounted Stinger concept proves successful, a formal requirements document will be proposed to begin the development and acquisition process.

Evaluation of the XM-85 towed Chaparral missile system has already been completed and the system will soon become a primary weapon of the new high-tech, light-division air defense battalion. The towed system will provide the same lethal firepower as the current Chaparral, but will be easier to transport in C-130 and C-141 aircraft and will be readily transportable by CH-47 helicopter as well. The towed Chaparral, developed and evaluated by the 9th DIVADA, Army Development and Employment Agency and the U.S. Army Missile Command will go into production early in 1984 with deliveries of all 9th Division systems anticipated by mid-1985. After further



A multiple-Stinger launcher mounted on a high-mobility, multipurpose, wheeled vehicle rolls off the assembly line, ready to be tested by the 9th DIVADA.

A Stinger section sets up the LEWR on a likely air avenue of approach.

evaluations in the 9th Division, the towed Chaparral may be fielded in other Army units.

Yet another final weapon system under study at Fort Lewis is the Rattler, a dual-purpose missile system capable of defeating both armor and attacking aircraft. Infantry proponents have recently published requirements for such a system. The Army Development and Employment Agency and the 9th Division are actively supporting this development as a means to provide a better self-defense, anti-air weapon as well as a replacement for the aging Dragon anti-tank missile.

C^2 Initiatives

Since any weapon is only as good as the C^2 system directing it, innovations in short-range air defense C^2 sensors and data distribution systems are also being undertaken.

One such innovation is the lightweight early warning radar which is scheduled for concept evaluation in August 1984. The LEWR is a surrogate for a man-portable active or passive acquisition system which could be given to air defense platoons or sections. The concept evaluation will be conducted during a field training exercise in which a Stinger section will use the LEWR in actual field conditions. This evaluation should lead to a further refinement of user requirements for such a system and possibly the development of formal requirements documents.

An even more ambitious project is the evaluation, under field conditions, of an automated SHORAD C^2 system capable of cueing gunners to target in all weather conditions and capable of dramatically improving the transmission of essential air defense C^2 data throughout the division.

This system will be based on inexpensive processors, displays and terminals as well as off-the-shelf surrogates for the single-channel, ground and airborne radio system now in development. As part of the 9th Infantry Division's automated distributed C^2 system, the air defense artillery component will integrate and share data with processors of the maneuver, fire support, intelligence and logistics systems in near real time. Evaluations are anticipated to begin in late FY84 and continue until late FY87 and will serve to develop organizational and operational concepts for such systems. Further, user requirements for automated C^2 systems will be derived as a result of these tests.

Although these efforts are extensive and ambitious, they are only the beginning. During the coming years, the Army Development and Employment Agency, the 9th Division and the other partners in innovation will strive to further improve air defense for light forces. New weapons, new ways to use existing weapons, enhanced sensor systems and improved methods of employment will be explored. The aim of the "Partnership for Innovation" is the development of a total air defense system which will enable light forces to preserve their freedom of action against any hostile air threat.

MAJ Clyde Simmons, *the executive officer of 9th DIVADA, has received bachelor's and master's degrees from Eastern Washington University, Wash. He has served with air defense artillery units in Germany, CONUS and Korea in positions ranging from platoon through battalion staff. Simmons was formerly the air defense program manager at the U.S. Army Development and Employment Agency.*

Divisional Hawk

by CPT Mike Locke and
1LT Lance David

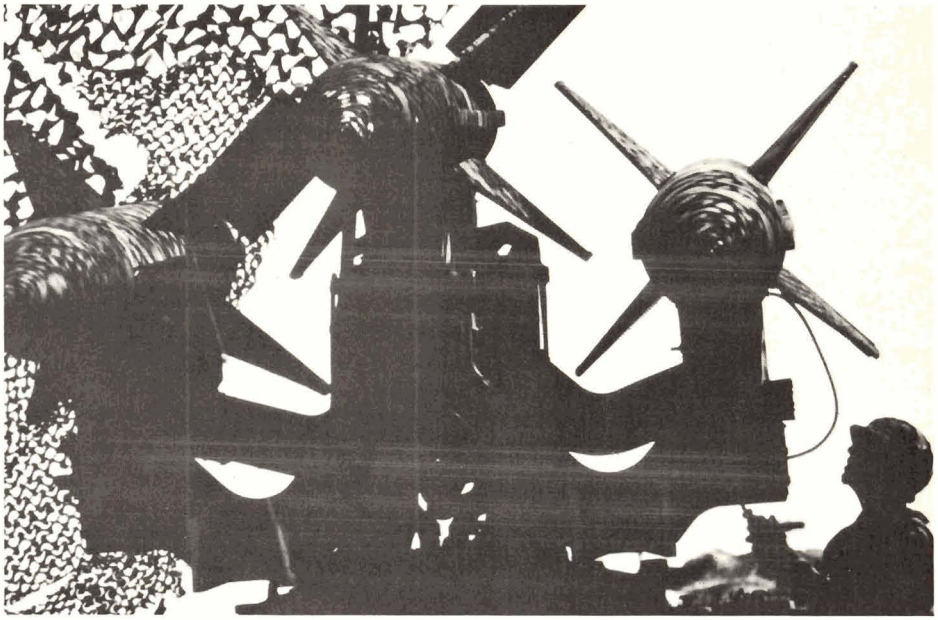
When a soldier hears the word "Hawk," the traditional images brought to mind are those of the European tactical sites, 24-hour manning, unfriendly weather and unfriendlier tactical evaluations. That is the popular image of the 32nd Army Air Defense Command in Germany. Soldiers assigned there depart CONUS with a fairly good idea of what to expect upon arrival.

However, most Hawk personnel do not know quite what to expect when they are notified of an assignment to a Hawk unit in CONUS. A posting to 1st Battalion, 4th Air Defense Artillery, is even a larger mystery. The 1/4 ADA at Fort Lewis, Wash., has the distinction of being the only U.S. Hawk battalion assigned under the command of a division. The mission of the 9th Infantry Division's (Motorized) Hawk battalion is drastically different than the 32nd AADCOM belt-style defense mission paralleling the West German border.

Upon its activation, Oct. 2, 1978, the 1/4 ADA found itself in an infantry division that understood Hawk no better than Hawk personnel understood infantry. Lack of equipment, key personnel and divisional air defense doctrine made the goal of providing low-to-medium air defense to maneuver units in a combat division seem light years away. Additionally, the infantry division was not sure it was ready for the expansive emplacements and radio frequency emission characteristic of a Hawk layout.

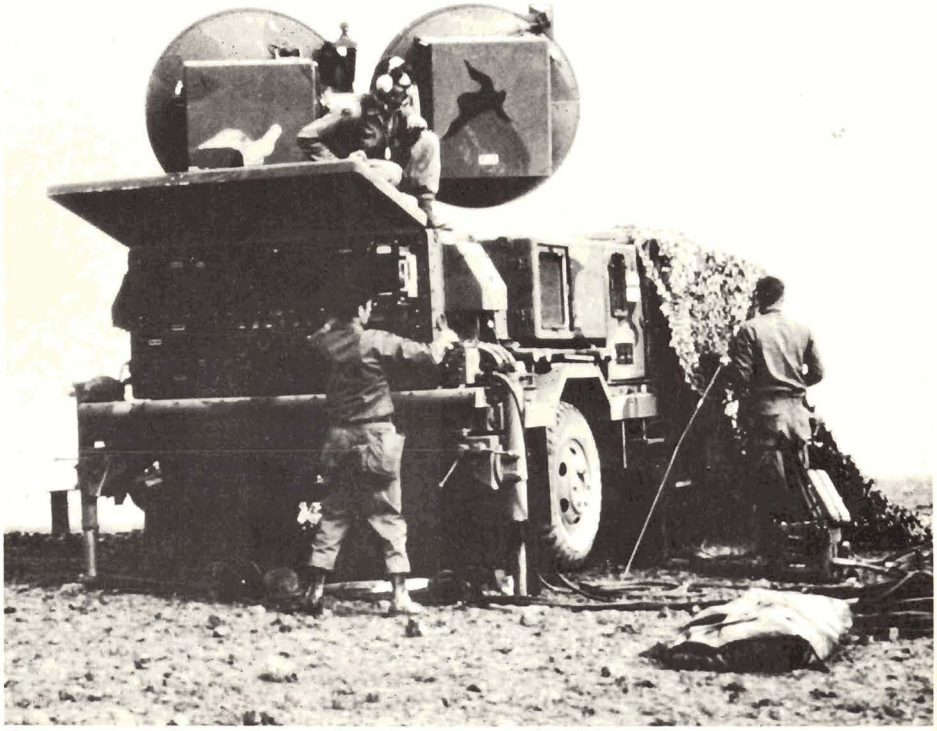
As equipment and personnel trickled into the newly activated battalion, and preliminary doctrine was established, the training focused on field craft, not just "dome-the-launchers" field craft, but get down-and-dirty, crawl-in-the-mud, infantry field craft.

The purpose of the 1/4 ADA's "infantry-intense" training was to demonstrate to our maneuver arms brothers that Hawk was no stranger to the field and could deal with virtually any deployment scenario or contingency plan the 9th Division could offer. The battalion works diligently on innovative applications of Hawk deployment to meet the challenges of providing air defense for a small, mobile division. Testing Hawk with various acquisition radars, the formation of five truck-assault squads and modifications to the traditional Hawk square configurations were but a few of the new approaches to divisional air defense devised.



Silhouetted against his launcher, a 1/4 ADA Hawk crewman performs safety and arming checks.

The iconoclastic nature of the 9th Division's organic high-to-medium air defense artillery and its departures from traditional deployment doctrine made it difficult to convince personnel



Crewmen camouflage an improved continuous-wave acquisition radar.

newly arrived from Europe that the new Hawk applications would work. Senior NCOs and highly skilled operators from the TAC sites of 32nd AADCOM were at first dubious that world geographical reference system (GEOREF) acquisition commands could be received over FM radio direct from AWACS surveillance aircraft. But once targets were successfully engaged, even the most tradition-bound veterans appreciated the applicability of non-traditional approaches to the accomplishment of the air defense mission.

Since 1980, the 1/4 ADA has participated in numerous divisional field training exercises at Yakima Firing Center, Wash., in an attempt to demonstrate its value and potential as a divisional asset. Yakima is an arid training region in the high desert east of the Cascade Mountains, less than 80 miles from Fort Lewis. The region encompasses a series of broad valleys and rolling hills that provide ADA units with textbook Hawk sites. It is in this environment that 1/4 ADA has effectively provided low-to-medium-altitude air defense coverage of division support area and elements, in addition to supplying the division with critical early warning.

In 1982 at Yakima, the 1/4 ADA seized the unique opportunity to enhance its early warning capability by establishing a viable interface between the Air Force TPS-43E radar and the Army's AN/TSQ-73 command and control system. This interface was further enhanced through joint training with Air National Guardsmen from Portland, Ore.

The battalion further developed its relationship with 9th Division by participating in Brimfrost '83, an exercise which marked Hawk's debut in Alaska. Once again the 1/4 ADA provided the maneuver commander with early warning and, more importantly, executed the first Hawk deployment to an arctic environment. Not only did the battalion's soldiers receive meaningful cold-weather training, but Hawk equipment was also maintained at an impressive 94-percent operational readiness rating. (See "The Arctic Hawks," *Air Defense Artillery*, Spring 1983.)

Although the 1/4 ADA prides itself on its field accomplishments and innovations, certain divisional support requirements do exist at Fort Lewis. For the past three years, the 9th DIVADA has been designated proponent for support of the 2,500-cadet 4th Region ROTC Advance Camp. Even though two infantry battalions assist, the task is a monumental one. The 1/4 ADA provides a significant portion of the overall ROTC support, supplying trainers, evaluators and controllers for land navigation, leadership reaction course, hand grenade, .45-caliber pistol and M-16 range committees. The battalion also participates in the air defense artillery display and the Hawk system orientation display each summer. Although air defenders receive excellent training while performing their summer camp duties, Hawk-specific training is temporarily forced to take a back burner to this critical support mission.

The 1/4 ADA has a long and honored lineage, being the second oldest regiment at Fort Lewis and having amassed 46 campaign citations and the Philippine Presidential Unit Citation. Since 1978, the battalion has worked hard to do justice to its past and to build a legacy for its future. As the Army's only divisional Hawk battalion, the "First of the Fourth" stands ready—anytime, anywhere.

Hooking the towed Vulcan to a UH-60 helicopter is a routine chore for soldiers of Fort Lewis' 9th DIVADA.

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1LT Lance David *is assigned as an assistant S-3 to 1/4 ADA, Fort Lewis, Wash. He was previously assigned as platoon leader and battery executive officer. He holds a bachelor's degree in political science from Wake Forest University, N.C.*

Hawk SLAM Increases Light Air Defense Firepower

by CPT John Warnke

The future battlefield portrayed in the Army's new AirLand Battle Doctrine is a non-linear battlefield characterized by rapid mobility over large unoccupied distances. Our mission, to provide our forces freedom to fight without interference from enemy air attack, remains the same, but the airland battlefield presents new challenges to Air Defense Artillery.

Limited worldwide high-to-medium-altitude air defense assets may deny traditional HIMAD protection to some units. The Hawk Support Light Assault Mode is a small, mobile package designed to provide non-traditional HIMAD to forward units operating outside the HIMAD umbrella.

There are two possible Hawk SLAM applications. Both applications take advantage of a "plug-in/plug-out" capability in which the Hawk SLAM slice is taken from the parent Hawk battalion and task organized with the contingency unit (division or lower) as a HIMAD asset. In the first application, Hawk SLAM can be the "first-in" element of Hawk air defense for the follow-on remainder of the battalion. The second application would be as a short-term HIMAD enhancement for a particular operation of critical importance that requires considerable air defense protection.

SLAM Defined

The Hawk SLAM concept has two purposes, to provide early warning through the short-range air defense unit to forward maneuver units and to increase air defense firepower. The parameters for the SLAM package include reducing the amount of necessary equipment and logistical support to levels mutually acceptable to the maneuver commander and the accomplishment of the air defense mission. The Hawk SLAM concept provides a lightweight weapon system with minimum launch capability, reduces the number of prime movers and equipment and produces a viable communications link with the existing short-range air defense early warning system. Personnel requirements are determined solely by the minimum number of personnel needed to operate and maintain the equipment.

Air defense tacticians have expended considerable effort to develop a workable SHORAD-HIMAD interface that coordinates air defense engagements and simultaneously provides real-time early warning throughout the battle area. However, Hawk SLAM operates without command and control from the parent unit. Instead, the Hawk SLAM package must communicate directly with the organic SHORAD unit to properly interface the SHORAD-HIMAD link.

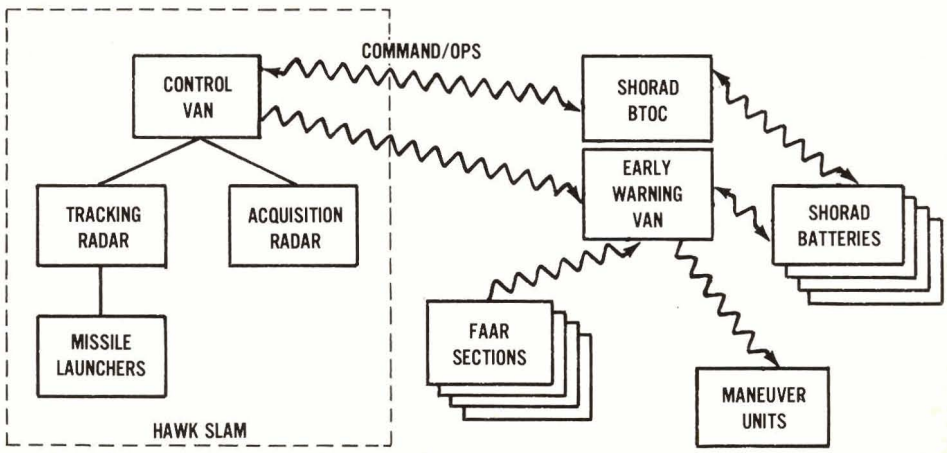
The SLAM package accomplishes this interface by linking the Hawk fire control van to the SHORAD battalion early warning van. The SHORAD battalion provides a liaison officer who works inside the Hawk control van and is linked by FM radio to the long-range plotter in the SHORAD battalion early warning van. The Hawk tactical control officer or tactical control assistant helps the liaison officer identify targets. Once a target is identified, the liaison officer determines the target's location in geographical reference and informs the long-range plotter in the SHORAD early warning van.

This long-range acquisition capability, coupled with SHORAD's organic forward area alerting radar aquisition, provides enhanced coverage of the air battle. Incoming aircraft tracks are broadcast over the division early warning net to all maneuver and air defense fire units. When the joint tactical information system Class II processors and display are provided via SHORAD command and control (C^2) MOD I (See "Automated Communications for Air Defense," *Air Defense Artillery,* Fall 1983) this link will be automated.

Obviously, the Hawk tactical control officer is forced to fight the air battle in an autonomous role, that is, without "engage" commands from the Hawk battalion fire distribution section (AN/TSQ-73). With the limited amount

SLAM PERSONNEL ROSTER

PLATOON LEADER	14D	1
WARRANT OFFICER	223 B	1
PLATOON SERGEANT	16D	1
FIRE CONTROL SECTION	16E	4
LAUNCHER CREWMAN	16D	5
HAWK MECHANICS	24C	2
	24E	1
	24G	1
MOTOR/GENERATOR MECHANICS	63B	2
COMMUNICATIONS SPECIALISTS	05B	2
		20



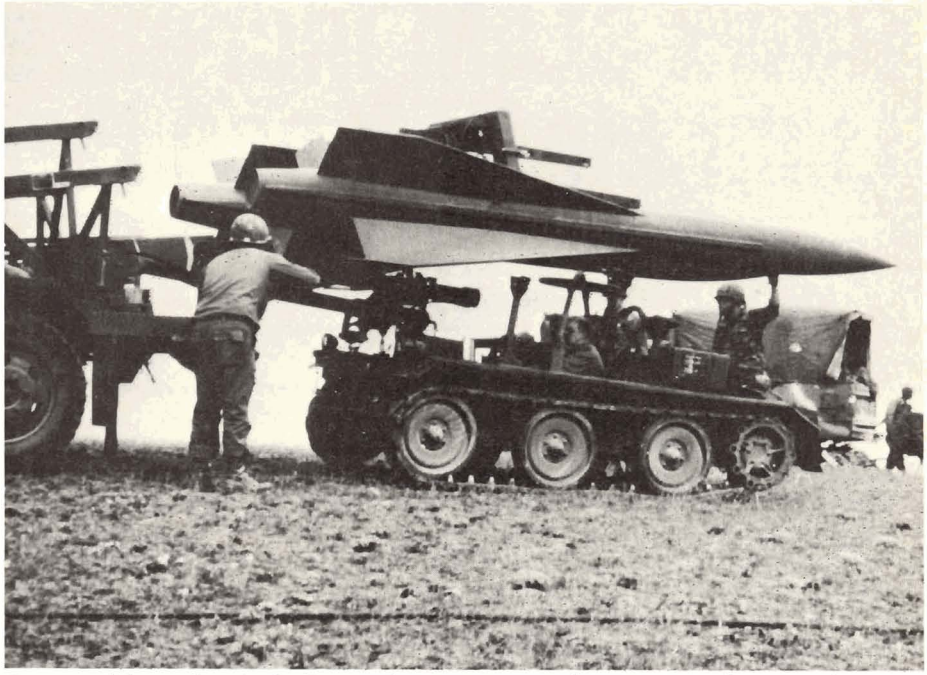
of missiles carried by the SLAM package, the tactical control officer must exercise restrictive engagement criteria when engaging hostile aircraft. Jammers, high-altitude bombers, mass raids and, of course, self-defense are acceptable targets while low-altitude close air support aircraft and helicopters should be left for SHORAD engagements.

Field Testing

With the Hawk SLAM concept firmly defined, the next step was to test the idea. The 9th Infantry Division is unique in that a direct support Hawk battalion, the 1st Battalion (Hawk), 4th Air Defense Artillery, is organized with a SHORAD battalion, the 1st Battalion (C/V), 67th Air Defense Artillery, under a divisional air defense brigade, the 9th Infantry Division Air Defense Artillery. The 1/67 ADA conducted a battalion ARTEP in September 1983 at Yakima Firing Center, Wash. After developing the concept with both the brigade headquarters and its sister Chaparral/Vulcan battalion, the 1/4 ADA deployed a SLAM package during the 1/67 ADA's ARTEP.

While testing the SLAM concept, some equipment choices were made that initially will seem unusual to any experienced Hawk officer. The pulse acquisition radar was selected over the improved continuous wave acquisition radar. Besides its longer acquisition range, the PAR video display has inherent advantages over the ICWAR. Unlike the ICWAR, the PAR can display exact target locations of more than one target simultaneously. The PAR video also makes it much easier to keep updated positions on many different incoming targets. Naturally, a new, state-of-the-art sensor would be preferable.

The battery control central was chosen over the platoon command post as the SLAM control van primarily because the PAR video cannot be displayed in the platoon command post. Furthermore, by using the battery control central van, one fire control console can be dedicated to the SHORAD liaison officer and his early warning mission while the other fire control console is used for Hawk engagements. It is interesting that many foreign nations deploying Hawk have developed a "black box" that allows PAR video to be displayed in the platoon command post. This capability remains compatible through Hawk Product Improvement Phase II.



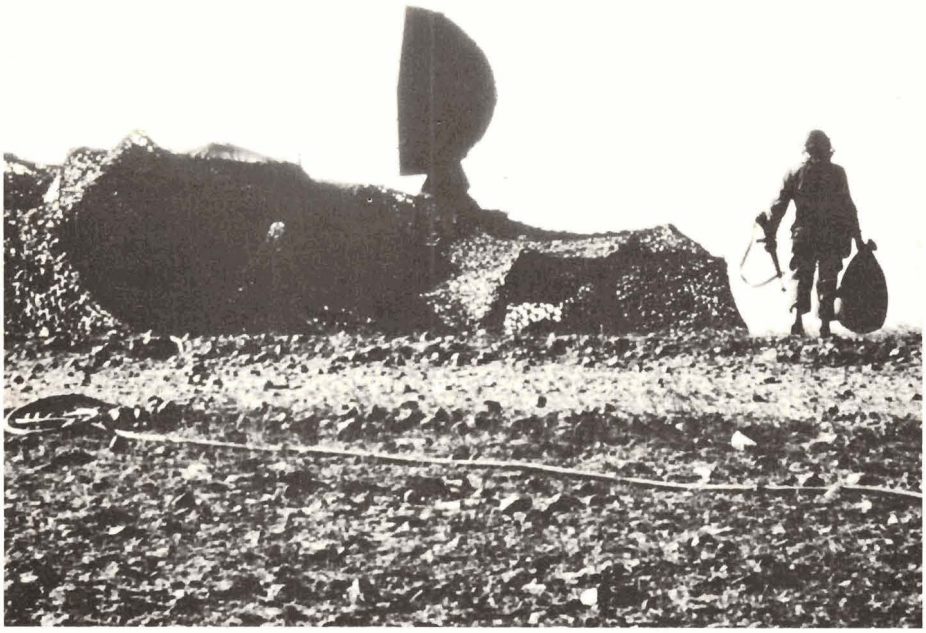
A successful transfer of missiles requires several ingredients: nerves of steel, patience and teamwork.

Two 60-kilowatt diesel generators were separated and placed in the cargo bed of a five-ton cargo truck to provide the necessary tactical power. A fuel truck was selected as one of the prime movers because all vehicles and end items, except the loader/transporter, are diesel powered.

The enemy air threat will dictate the decision to bring two launchers and two missile pallets or one launcher and three missile pallets. Ideally, the launchers would be modified to allow transport with the missiles loaded on the launcher.

HAWK SLAM EQUIPMENT

TYPE OF PRIME MOVER	SECONDARY LOAD	TOWED LOAD
5-TON	BCC	MISSILE LAUNCHER
5-TON OR FUEL TANKER	Tank/Pump Unit	ICC
5-TON	60 KW (2)	LAUNCHER OR MISSILE PALLET
2½-TON XLWB (EXTRA LONG WHEEL BASE)	LOADER TRANSPORTER	PAR
2½-TON XLWB	TROOPS, SUPPLIES PAR CAGES, ETC.	HIPIR
2½-TON XLWB	PALLET WITH 3 MISSILES	PALLET WITH 3 MISSILES



A soldier moves to his defensive position on the perimeter while the improved continuous wave acquisition radar looks for a low-flying foe.

Since the SLAM concept was developed to provide a HIMAD asset for a limited duration, only a small prescribed load list is necessary to sustain operations. During testing, the PLL was stored in a customized wooden shelter mounted in front of the control van. Direct-support maintenance will wait until the SLAM package is reunited with the parent unit and reconfigured to more traditional employment configurations.

The exercise was extremely valuable in that it proved the SLAM concept works. The early warning capability provided by the 1/4 ADA SLAM package significantly improved the SHORAD early warning capability. The increased Hawk firepower allowed a marked improvement in available air defense engagement capability and provided an excellent umbrella of air protection for the maneuver commander. The HIMAD-SHORAD interface provided excellent training for both Hawk and Chaparral/Vulcan crewmen.

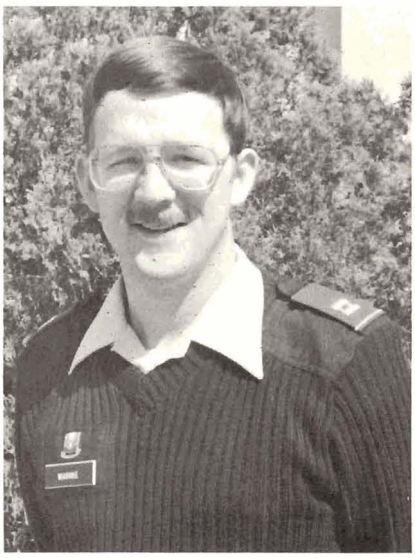
Some important lessons were learned, primarily in the area of command and control of the SLAM package. Since there is no written doctrine governing the SLAM concept, the command relationship between the SHORAD battalion and Hawk SLAM platoon is unprecedented. A second FM link between the Hawk tactical control officer and the SHORAD command net alleviated many potential problems and served as a means to pass air defense control measures, warning orders and march orders. In a potential scenario in which a multichannel link from the SLAM to Hawk higher headquarters is activated, the FM link to the SHORAD battalion would terminate with a communications operator in the control van.

Tactically, a two-phase release from the air defense mission drastically reduces march-order time. Phase I requires the release and march order of all SLAM package equipment from the Hawk engagement role except the control van and acquisition radar. This exception permits the continued reception and transmission of early warning information until the last possible moment. When the second phase of the release is executed, Hawk SLAM can be on the road in a matter of minutes.

Future SLAM

Some potential improvements to the Hawk SLAM concept could include development of a state-of-the-art acquisition and tracking radar; PAR video displays in the platoon command posts and replacement of the Hawk missile with a lighter, shorter-range, launcher-transportable missile. Considerable improvements can be made in the present 60-kilowatt generators in noise reduction and down-sizing while increasing fuel efficiency. Additionally, more work is needed in defining the responsibilities of managing the air battle and other Hawk SLAM command and control procedures.

Clearly, the first test of Hawk SLAM was successful in validating the concept. Hawk SLAM, as a lightweight, mobile air defense asset is valuable in its two-fold mission, early warning through SHORAD to the maneuver commanders and increased air defense firepower. Although improvements can further enhance its potential, Hawk SLAM can provide HIMAD protection for a contingency division employed forward of the corps protective Hawk umbrella right now.



CPT John Warnke, *a West Point graduate, has served as a platoon leader, battery executive officer and assistant S-3 with the 1/4 ADA at Fort Lewis, Wash. He is currently attending the ADA Officers Advanced Course at Fort Bliss, Texas.*

Towed Chaparral

Firepower For Light Forces

by 1LT Dan Mooney

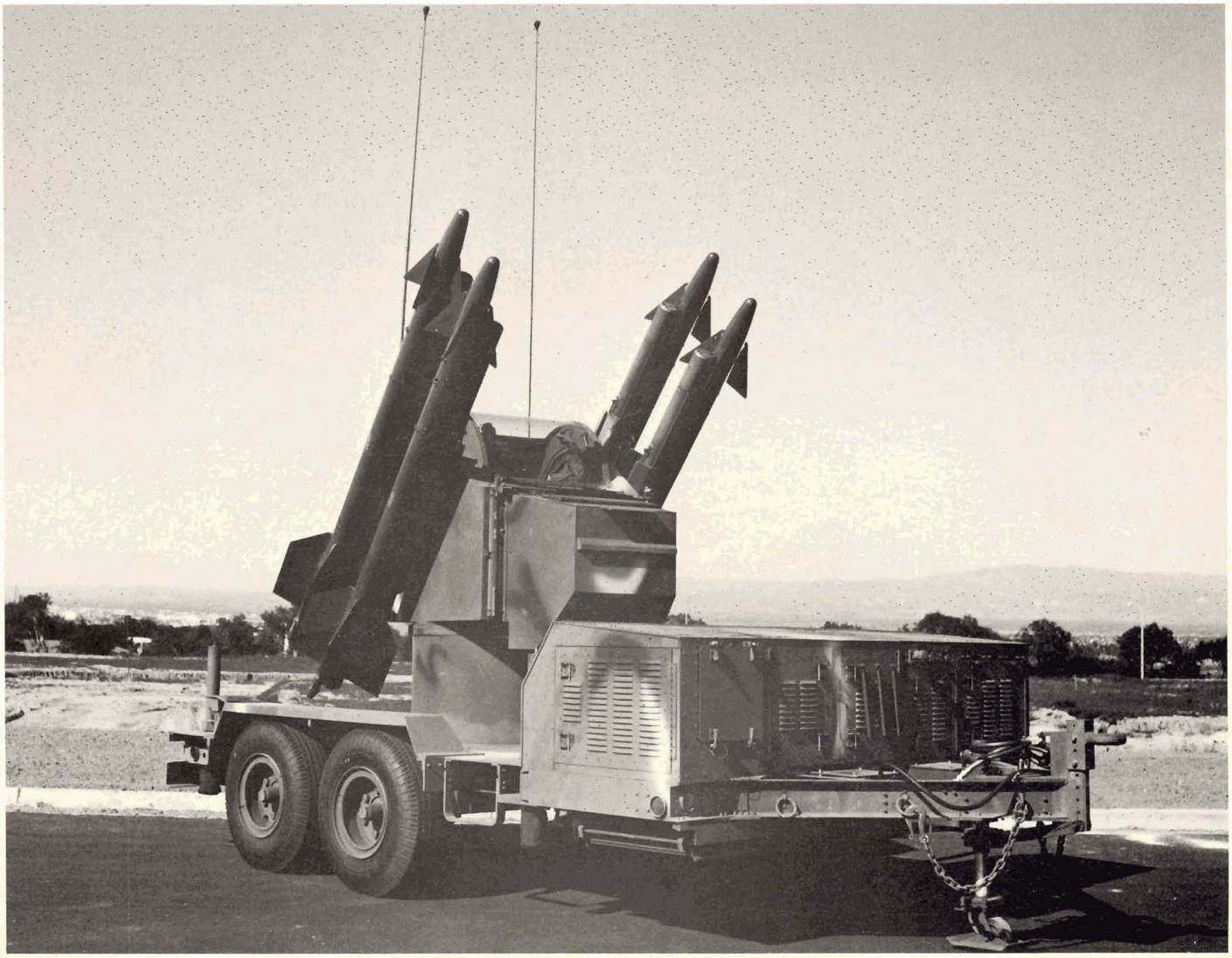
The high-tech light division concept provides difficult challenges for divisional Chaparral/Vulcan batteries. How do you reduce total weight and the number of airframes required for rapid deployment and lodgement of an air defense missile system while retaining the maximum air defense capability that will be so vital on the modern battlefield?

This was the challenge faced by the Army Development and Employment Agency, the 9th Infantry Division Air Defense Artillery and the 1st Battalion (C/V), 67th Air Defense Artillery, Fort Lewis, Wash.

Their solution: Towed Chaparral.

The towed Chaparral, manufactured by Ford Aerospace & Communications Corp., consists of three major components: the M-54A1 aerial intercept, guided-missile system with IFF capability; a guided missile equipment carrier trailer and the MIM-72 series missile. The launching station and missiles are not newcomers to the Army inventory, but are the same as those found on the self-propelled Chaparral. It's the trailer that makes the towed Chaparral unique and so light.

The trailer is of aluminum box-frame construction. It uses an elliptical leaf-spring suspension with air-over-hydraulic brakes. The system rides on two, 3-inch square straight axles with four tires mounted in tandem. The trailer with launch station contains all the necessary equipment to aim and launch missiles. The equipment needed to operate the system is housed in the metal equipment compartment located in front of the trailer. The system, fully equipped and serviced, including fuel and four storage missiles, weighs 12,500 pounds, about half as much as the self-propelled version. The new



The towed Chaparral has been proven a reliable and formidable lightweight air defense missile system.

Chaparral is designed to be towed with any standard five-ton vehicle. A 2½-ton truck can be used in a pinch, but the five-ton truck's power steering makes it much easier to maneuver the towed Chaparral over rough terrain. Additional equipment, such as a spare tire for the trailer, wings, fins, communications equipment, emplacement pads and tools, is carried in the truck.

Crew transition to the towed Chaparral is relatively easy. The equipment used is identical to gear on the self-propelled version. The operation and maintenance of the towed Chaparral and self-propelled Chaparral are the same since only the location of some components is different.

The biggest difference between the towed Chaparral and the self-propelled version is the absence of an erect/retract system on the towed Chaparral. Other differences include the use of a missile load ramp and emplacement pads. The missile load ramp, when attached to the rear of the trailer, provides a walkway for personnel loading missiles onto the launch rails. The emplacement pads with jack screws are designed to firmly support the weight of the towed Chaparral during firing. It is not a requirement that the towed Chaparral fire unit be level, but consideration should be given to ground condition and slope prior to emplacement.

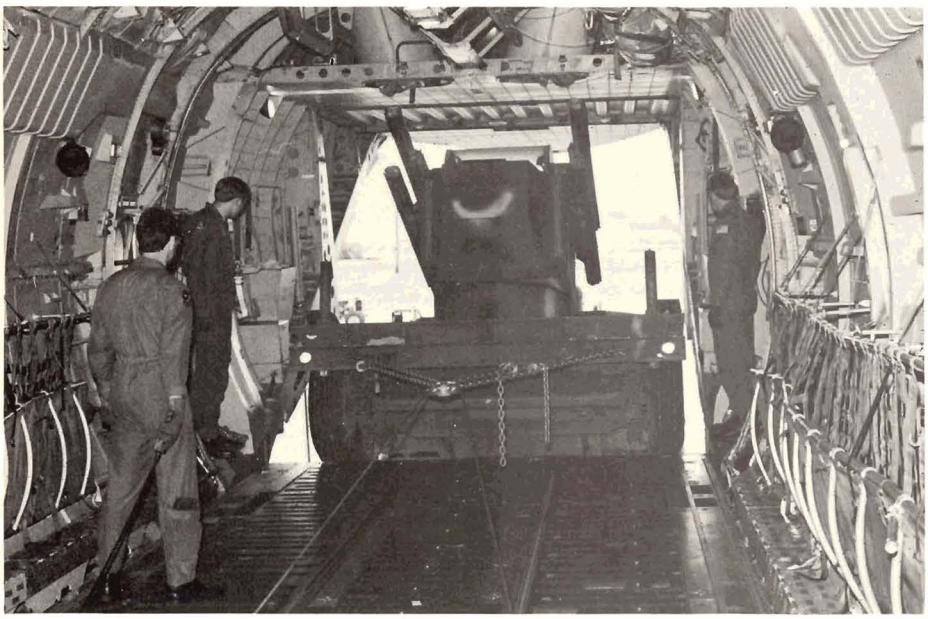
The first towed Chaparral prototype arrived at Fort Lewis in April 1982. Since that time it has been used extensively during division, battalion and battery field training exercises and ARTEPs. The towed Chaparral has a record of successful day and night firings during two annual service practices.

The towed Chaparral has successfully traveled the heavily wooded training areas at Fort Lewis and also the desolate, barren terrain of Yakima Firing Center, Wash. During the deployment to Yakima, the towed Chaparral was transported by a CH-47D Chinook helicopter. The system needs no extensive preparations for an airmobile operation. With four lift shackles and four chain slings, the system can be prepared for an airmobile operation in a matter of minutes. Once placed in its new location, the towed Chaparral needs no special maintenance to become operational. If it needs to be moved, any 2½-ton truck or larger can do the job.

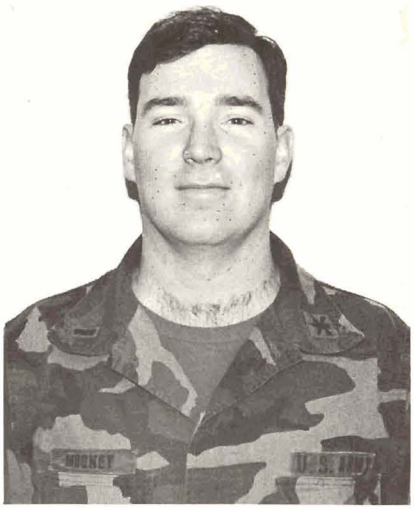
Besides its airmobile capabilities, the towed system is well suited for airlift operations and will play a vital role in the strategic deployment of air defense missile systems. It is 210 inches long, 105 inches wide and 102.5 inches high. Five towed Chaparrals, or three towed Chaparrals and one prime mover, can be transported in a single C-141B StarLifter. Once on the ground, a single five-ton vehicle can shuttle all the fire units to their emplacement positions.

Typical of sophisticated weapons, the towed Chaparral has some limitations, but many of these are eclipsed by its numerous capabilities. Extremely rough terrain may present problems because the trailer's ground clearance is only 14 inches, but the system moves extremely fast on hard-surfaced or semi-improved roads. When preparing to move, crews must take the time to hook the prime mover to the trailer. However, once the system is emplaced, it has an extremely low profile and can be camouflaged quickly with only four nets. Finally, although only eight missiles are present on the trailer, the five-ton vehicle can hold quite a few more. The 1/67 ADA is scheduled to receive towed Chaparrals equipped with forward-looking infrared sensors and a diesel prime mover in the fall.

All things considered, the towed Chaparral has proven to be a reliable and formidable lightweight air defense missile system.



The towed Chaparral is placed on board a C-141 aircraft for air movement.



1LT Dan Mooney *is a FAAR platoon leader assigned to the 1/67 ADA, Fort Lewis, Wash. Mooney graduated from the University of Georgia with a degree in education and entered the service in 1979. He received his commission after completing officer candidate school in 1981. Mooney attended the ADA Officer Basic Course, was initially assigned to Headquarters, FORSCOM, and served as a Chaparral platoon leader with the 1/67 ADA prior to his present assignment.*

Facing Automated Command And Control

by CPT David K. Eachus

"Blazes, what a mess!" grumbled 2LT Byte as he stumbled into his platoon command vehicle. He had just confirmed his worst suspicions.

PFC Grid, his radio-telephone operator/driver, looked up from his terminal, concerned and not a little afraid. "Sir, 1st Squad is still not reporting."

"They won't be either," growled Byte, "1st Squad is a smoking wreck!"

Grid paled and turned back to the platoon command terminal.

"Is battery up on the net?" asked Byte.

"Yes sir. I received an update not more than five minutes ago," responded Grid.

"Good. Call up the status report format for me," ordered Byte.

"Got it, sir. Do you want me to fill in the menu?" queried Grid.

"No," said Byte "thanks anyway, but I'll do this myself."

With that Byte slid into the seat vacated by Grid and prepared to enter the required information. "Thank heavens, I don't have to type anything. With these NBC protective gloves, I couldn't hit a single key by itself."

Beginning to feel the shock of the event, Byte allowed the computer, in less than a minute, to lead him through completing the required status report. He accomplished this by simply moving the cursor across the format menu and choosing the correct entry. Pressing the transmit key, Byte burst-transmitted his completed report to his battery tactical operations center and beyond.

"Well, that's taken care of. Now to adjust the coverage of my other three squads." He turned back to the terminal and began to call up the format for change of mission order to the squads.

As he did so, his first message had been received by computers at battery, battalion and division levels, and was being processed in accordance with established programs. The computer in the battery TOC automatically flashed a priority message signal across the screen of the battery command terminal and the battery executive officer read the change on his status display.

The same events took place simultaneously in the battalion TOC as the S-3's status display was automatically updated to show the loss as a flashing symbol. Across the TOC, the S-1 and S-4 terminals were alive, showing the names of the lost crew members and the depletion of classes of supplies on hand in that platoon. At the same time, the battalion computer contacted the division material management center's computer to initiate requests for replacement Class II, III, IV, V and VII items, while concurrently requesting personnel replacements by grade and MOS from the adjutant general's computer.

The division airspace management element and the G-3 status boards automatically updated the current air defense fire unit status, while the G-2's air intelligence file was accessed to add the relevant data concerning an enemy air strike. Meanwhile, back in Byte's platoon TOC, the format for the change of mission order had appeared on the screen of his platoon terminal.

As illustrated in the scenario above, the impact of a computer-assisted, distributed command and control system on today's division is immense. Tasks which now entangle entire staffs will be handled by computers with a man-computer interface providing priorities and programming as required.

This is not a distant vision, but rather a short-term reality for the soldiers of the 1st Battalion, 67th Air Defense Artillery, 9th Infantry Division, Fort Lewis, Wash. The 9th Infantry Division distributed command and control system began playing a role in the battalion's everyday operations in August 1983.

The system being developed in the 9th Infantry Division is a surrogate for the objective Army DCCS. The 9th Infantry Division concept is to take commercially available computer hardware and engineer it to interface with current Army standard communications equipment or commercially leased radios having single-channel, ground and airborne radio system capability to form a netted division computer command and control system.

To develop the concept, the division identified 16 critical command and control nodes at which to establish duplicate capabilities. The division's Chaparral/Vulcan battalion was chosen as one of these nodes.

The 1/67 ADA has received a variety of computer hardware. The foundation of the 9th Infantry Division DCCS is the WICAT central processor. This processor can be netted with the other 15 WICAT processors in the division via tactical telephone, FM tactical radio or commercial telephone or cable. Each WICAT is capable of performing all required data processing and storage functions for any or all of the other nodes in the DCCS net and is programmed to contact each of the other WICAT computers periodically and update all data banks to preclude loss of vital data should a node be destroyed or disabled. The WICAT does this automatically, including dialing the telephone or keying the radio as required. The direct implication is that the division can be commanded from any one of the 16 nodes with relatively equal effectiveness.

Access to the WICAT is provided by two types of terminals. The battalion S-1 and S-4 are equipped with the Ann Arbor terminal which consists of a standard typewriter keyboard and a cathode ray tube display. This terminal, however, is much more than a terminal. The battalion S-2 and S-3 are equipped with the grid-compass computer. Though it functions as a terminal for the WICAT, it is a fully functional, portable computer capable of integrating with the WICAT. The grid-compass has a 256K RAM coupled with a 385K bubble memory. It can be netted to the WICAT either by cable, tactical or commercial telephone or by tactical FM radio. These characteristics make the grid-compass a stand-alone work station even when it is separated from

a WICAT. This capability significantly increases the tactical flexibility of the 9th Division DCCS.

Additional peripheral hardware supplied to the battalion include a 10-megabyte hard or floppy disk combination drive system, a 160-character per second printer, a portable floppy disc drive for use with the grid-compass computer and eventually a videodisc map graphics system capable of electronically displaying maps with superimposed, computer-supplied, graphic symbology.

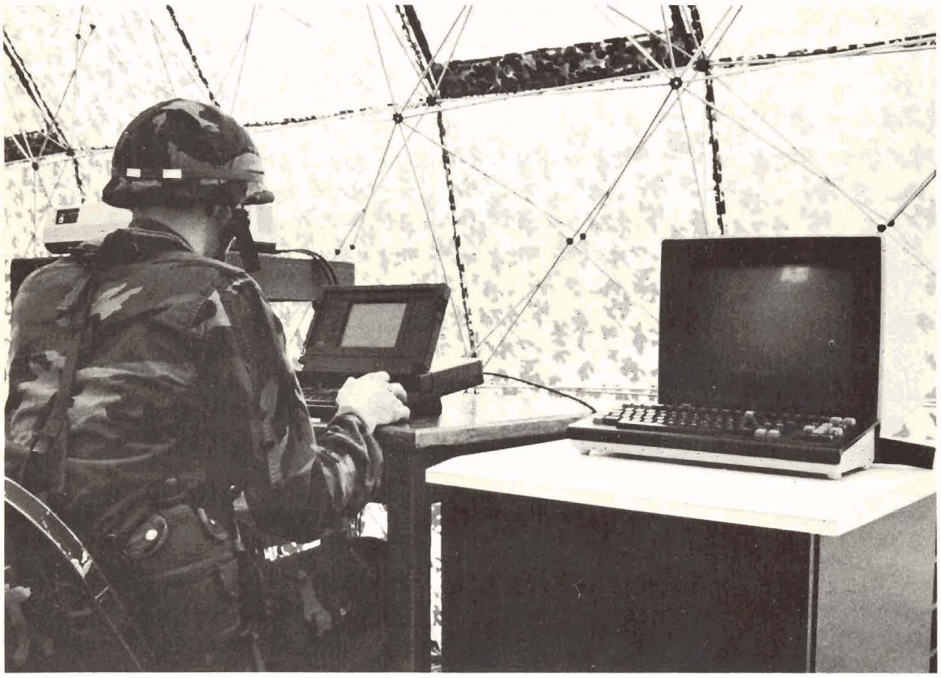
On the software side of the house, a contract was let to provide user software for the 9th Division DCCS. The general purpose software, a word-processing program, a database-management program, a spread-worksheet program, a graphics program and a system-management program have been available since July 1983 and are being used extensively in everyday operations within the battalion. Specialized software, such as the formatted messages described in the initial scenario, became available in November 1983 and is being evolved through a series of operational exercises.

For the division air defense battalion, DCCS offers opportunities of untold proportion. For the first time, it is reasonable to expect real-time information exchange between sources of air defense intelligence. The air defense artillery battalion commander and S-3 will have immediate access to all information available to the division staff.

Although the 9th Division DCCS described does not, in itself, meet all the alerting, warning and cueing requirements of the objective Army short-range, air defense command and control system, it makes sense to integrate air defense automation to share critical battlefield data with other functional users (maneuver, fire support, intelligence and logistics). For example, if air defense artillery sensors detect an enemy airmobile unit crossing an undefended area to a landing zone in the division rear, the air defense processors could instantanously pass the LZ location to the tactical fire direction system for immediate attack by division field artillery. Similarly, if non-air defense sensors detect an enemy aircraft, that data must find its way quickly into the air defense command and control system.

Toward this end, the 9th Division Air Defense Artillery and the Army Development and Employment Agency are working jointly to produce, in the near term, an automated, distributed alerting and warning system for use in the 1/67 ADA. This system will use the same hardware as the 9th Division DCCS. By the time the Army SHORAD Module 1 is available to provide an automated data link from the SHORAD battalion to either a high-to-medium-altitude air defense source or directly to AWACS, the near-term surrogate demonstration architecture will be in place. The goal is to automatically distribute the total air battle picture to battery and platoon level with appropriate filters to focus the information to each user level. Included in the system will be a user-friendly display device at gunner level for alerting and warning. The next step, which may come as soon as FY86, will be the integration of a state-of-the-art sensor at battery and platoon level to provide correlated local data and the ability to cue weapons to the spot in the sky, day or night, where hostile aircraft will appear.

The overall goal of the 9th Infantry Division distributed command and control system is to provide the computer-assisted management tool the division will need to win the first battle of the next war. The 9th Division is required to have a fully operational DCCS by May 1985. For the soldiers of the 1/67 ADA, the challenge of learning to use tomorrow's high technology is facing them today.



Automated command and control hardware, such as the grid-compass computer, is light and compact.

CPT David K. Eachus *is the S-3 of 1/67 ADA, 9th Infantry Division, Fort Lewis, Wash. He is a 1976 graduate of the United States Military Academy. He served his first tour of duty with the 2nd Battalion, 59th Air Defense Artillery, 1st Armored Division, Schwabach, West Germany.*

The Soldiers Speak

by 2LT David Van Meter

The success of any military organization is directly related to the enthusiasm and efforts of its soldiers. The 9th Infantry Division Air Defense Artillery, an organization that is changing the way the Army thinks about air defense, has earned a reputation for innovation that is second to none. Thus it is not surprising to learn that the soldiers of 9th DIVADA are not only receptive to change and experimentation, but are themselves a prolific source of creative ideas regarding the future of air defense.

The challenges to these soldiers are obvious: to formulate, test and evaluate a bewildering array of new equipment and concepts with the final objective of developing an operational and organizational system for the air defense of the 9th Infantry (Motorized) Division.

SP5 Bryan C. Harris, an information coordination central mechanic assigned to Battery C, 1st Battalion (Hawk), 4th Air Defense Artillery, is especially concerned with adapting existing weapon systems to meet the needs of the 9th Division. "One of our biggest challenges," Harris said, "has been to integrate Hawk with Chaparral and Vulcan, which are more mobile. As a solution, we developed the Hawk support light assault mode package. SLAM is an assault fire unit with only the pulse acquisition radar, the high-power acquisition radar, the information coordination central or battery control central and two launchers. We deployed the SLAM package on an ARTEP with the Chaparral/Vulcan battalion, and it worked out very well. Everyone agreed that this idea is a real sleeper."

Harris is impressed with the aggressive mood of innovation which pervades 9th DIVADA. "I saw a lot of people using their heads on that ARTEP. The attitude was 'make it work!' " he said.

Making it work takes on a new meaning for 2LT John C. Breletic, a platoon leader with Battery D, 1st Battalion (C/V), 67th Air Defense Artillery. Breletic is faced with the challenge of developing an employment doctrine for a new weapon system, the towed Chaparral. "The towed Chaparral," he reflected, "gives us more strategic and operational mobility than we had before. But you can't use it like a self-propelled system. Since a CH-47D can sling-load the weapon, we are exceptionally responsive to changes in assets to be protected. But since our prime mover, the five-ton truck, is not airmobile, we've got to preplan our positions carefully. Essentially, we are rewriting FM 44-3."

The improved operational mobility of towed Chaparral has opened an entirely new realm of air defense missions for Chaparral, one of them being air-lifted to protect forward arming and refueling points (FAARP) used by the division's helicopter brigade. This, of course, presents planning and coordination challenges for air defense leaders.

"The guys from the helicopter brigade like having us around to fend off Hinds," Breletic laughed, "but I'll tell you what, seeing a Chaparral sitting on their FAARP has started a real rush on IFF training among the helicopter pilots."

Not only are 9th DIVADA soldiers experimenting with doctrine and ideas, many are actually participating in the development of new weapon systems. SSG Scott A. Morrill, a squad leader assigned to Battery B, 1/67 ADA, is working with a contractor in developing a new self-propelled chassis for Vulcan.

"When we were shown the prototype of the hydrostatic Vulcan wheeled carrier, we were really excited," Morrill said. "Finally, here is something light enough to be lifted by air and mobile enough to keep up with the fast attack vehicles and the light-assault guns on the battlefield. The carrier is essentially an eight-wheeled, all-terrain vehicle, so it can go just about anywhere. Not only that, but with its hydrostatic suspension, it can provide a level gunnery platform even while on a slope."

Morrill has also become accustomed to the more mundane details of research and development.

"The manufacturer presented us with a basic vehicle. There were no military accoutrements. We had to tell them where to put such items as the lights, radio mounts, tow pintles and bustle racks," Morrill said.

Most mothers love their own babies,

Soldiers of the 9th DIVADA prepare a towed Vulcan for an airmobile operation.

no matter how ugly the kid may be. A more honest evaluation can usually be solicited from other kids on the block. Similarly, it is expected that the air defense artillery officers and men who have created and nurtured 9th DIVADA are particulary pleased with their handiwork. Yet most of the other "kids" on the 9th DIVADA "block" share the enthusiasm for this young organization. This is especially true of those soldiers in support MOSs who must not only meet a plethora of routine and recurring "real world" problems, but who must also be flexible enough to tailor their support to meet the evolving needs of 9th DIVADA. Indeed, most of these soldiers have been infected by the atmosphere of innovation and creativity which prevails throughout 9th DIVADA and are striving to make their own contributions to the organization's future.

SFC Beryl Reaser is assigned as the S-4 NCOIC of 1/67 ADA. Perhaps more than anyone, he is affected by the implementation of new concepts, since he is the primary point of contact between the battalion and the Army Development and Employment Agency, one of 9th DIVADA's partners in innovation.

"The conversion to high technology is really taxing the logistics channels, since a lot of the organizations in the division are still transitional or notional," Reaser said. "A lot of times the user of a piece of equipment identifies a new need for a support which doesn't exist yet. Still, it's a lot of fun. You never know from day to day what new equipment we'll be getting. The other day new quick-erect tents arrived; I'd never seen one before, but it's so simple that I had the tent erected within six minutes."

SGT Johnnie Richardson III, who works in the S-2 section of Headquarters and Headquarters Battery, 9th DIVADA, asserts that it's not only 9th DIVADA personnel who find futuristic air defense weapon systems a matter of interest.

"A lot of other nations have intelligence collection assets deployed against us here at Fort Lewis," Richardson said. "One of our biggest jobs is ensuring security here. Even guys picking aluminum cans out of trash bins could really be looking for stuff we've thrown away which discusses the things which DIVADA is developing."

"Exercises are especially fun," Richardson said, "because the S-2 section plays the part of the enemy. We try to create the situation as it really might develop. By fighting the 'enemy' we make up, the commanders can see if they need to modify their doctrines and tactics."

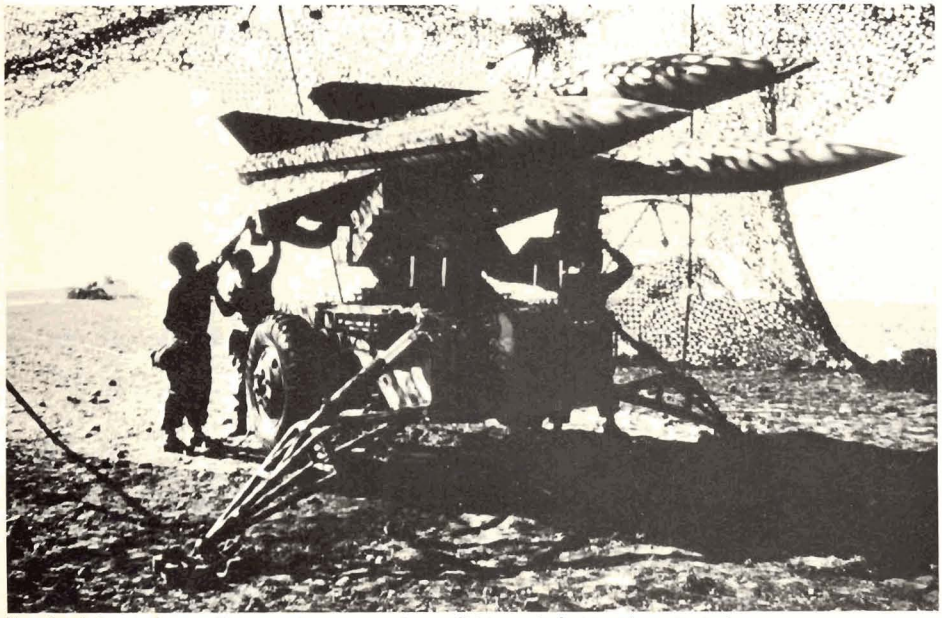
One of the soldiers responding to the input of SGT Richardson and the S-2 section is SGT Sandra Lacosse, the NBC training NCO of 1/4 ADA. "Maintaining the soldiers' proficiency in basic skills while training them in new concepts and ways of doing things is probably the biggest challenge facing me," Lacosse said. "Let's face it, some of the new things we are trying are time consuming, and people tend to let the more routine areas of training slip."

One thing she is adamant about, however, is NBC training. "The 9th Division is going to move so fast across such a large battlefield that the enemy may have no choice but to try to contain us with chemical and nuclear weapons," Lacosse said.

Supporting a fast-moving division is also a problem for SSG Fredrick Bibeau, a 31V tactical communications system operator/mechanic serving as the communications chief for Battery B, 1/67 ADA. "Communications across long distances and bad terrain is really a challenge," he explained. "In fact, commo guys are notorious for being grumpy while on FTXs. It's because we never get any sleep."

Innovation and flexibility in support of his unit are facts of everyday life for Bibeau. "We usually solve our problems one way or another," he said. "On the last FTX we used relays in jeeps to talk to everybody in the net."

The 9th DIVADA is, indeed, moving quickly forward across a wide expanse, not only in the field but also in the areas of doctrine, training and equipment development and procurement.



No check is too insignificant when preparing a firing unit for combat operations.

2LT David Van Meter, *a military intelligence officer, is the S-2 for the 1/67 ADA. A 1982 graduate of the University of Nevada, Las Vegas, Meter received his bachelor's degree in history.*

An Interview With The 9th DIVADA Commander

by MAJ Robert Perceval

". . .a challenging and exciting period for light air defense in a fantastic environment."
—COL Donald M. Lionetti

"The Commander, 9th Infantry Division, is charged with developing revolutionary approaches in tactics and equipment that can evolve into a new kind of division. . . ."
— Gen. E.C. Meyer

When the 9th Division received these marching orders in October 1981, the Army launched one of the most innovative programs for change in its 209-year history. Take a light infantry division, couple it with the most innovative off-the-shelf technology, develop doctrine, concepts, and organizations, train soldiers and complete this process by 1986 was the wide-margined charter given the division.

To aid this process, an organization called the High Technology Test Bed was formed. This organization was given the mission of interfacing with the 9th Division, industry, TRADOC, DARCOM and other agencies to assist in the 9th Division transition. The High Tech Test Bed, now called the Army Development and Employment Agency, continues this mission today.

The transformation and reconfiguration of the 9th Division were not focused on infantry units alone. The charter for changes also encompassed aviation, engineer, military intelligence, signal, artillery and air defense artillery assets.

COL Donald M. Lionetti assumed command of the 9th Division Air Defense Artillery in December 1982. Prior to that, he had served as deputy director of the High Tech Test Bed where he was able to assimilate the entire spectrum of the 9th Division's development process. A graduate of the National War College, he holds a master's degree in engineering. His knowledge of soldiers and the development of the latest concepts in air defense artillery equipment, tactics and employment makes his comments worthy of review by the entire air defense community.

Air Defense Artillery: What has been the most significant contribution of DIVADA to the Army ADA community?

Lionetti: The most significant contribution has been to push 'the system' into early consideration of innovative approaches to air defense for light forces. Bringing concepts through funding to fielding within the deliberate materiel acquisition process is an excruciatingly long event. With ADEA, we've been able to short-cut the process. We put ideas into action in a much shorter time.

Air Defense Artillery: Why involve units in the developmental process? What do TOE soldiers know about the materiel acquisition process?

Lionetti: You just can't duplicate the ADA battery or battalion environment in a laboratory or in some developer's office. Moreover, the chain of command in a TOE unit is best capable of addressing the organization, operation and materiel needs of its unit. Young soldiers are the most important contributors to the process. They often have the best ideas and aren't hesitant in the least to suggest and put innovations in motion. Totally uninhibited, they don't hold back in telling you an idea or concept is screwed up from the soldier's point of view. Their enthusiasm is tremendous.

Air Defense Artillery: Is Fort Bliss involved in these modernization initiatives?

Lionetti: Absolutely! I say repeatedly to my guys that any improvements to light ADA we conceive can come to fruition only with the support of the U.S. Army Air Defense Artillery School and its commandant, MG James P. Maloney. We also work very closely with the school's Directorate of Combat Developments, and we communicate daily with the directorate's liaison officer who works at ADEA.

Air Defense Artillery: What's your greatest challenge at the 9th DIVADA?

Lionetti: Finding enough time to pursue the good ideas our DIVADA soldiers come up with. Believe me it's not a

complaint. I don't want to turn any of the creative juices off. We are in the middle of a challenging and exciting period for light air defense in a fantastic environment. The 9th Division is truly a commander's division, where we air defenders are listened to and feel solidly integrated into the combined arms concept.

Air Defense Artillery: Do you have any frustrations?

Lionetti: My personal frustration is dealing with the provisional nature of the DIVADA headquarters. It means staffing by special duty assignments from the battalions. As a result, I try to keep the staff as small as possible yet still achieve effective and maximum support for our soldiers.

Air Defense Artillery: With all that is going on in the modernization business, when do you find time to train?

Lionetti: DIVADA acts as the modernization focal point and shelters, to the maximum extent possible, the battalions from the details of developing equipment and organizational and operational concepts. This permits them to focus on training and sustain their combat readiness. Our battalions do everything all TOE units do like ARTEPs, EDREs, AGIs, FTXs and everything in between . . . and they do them well. We don't screen them from any of those missions just because we are also in the modernization business.

Air Defense Artillery: How do DIVADA soldiers stack up against those in the battalion you commanded in Germany a few years ago?

Lionetti: Although your love affair with the battalion you commanded never fades, and that's certainly true in my case with the 2nd Battalion, 60th Air Defense Artillery, I must say the quality of soldiers at all grades in today's Army and DIVADA far surpasses the Army of 1977 to 1979. The most dramatic difference is evident among our younger soldiers who are bright, motivated and hard-working.

Air Defense Artillery: Has the DIVADA concept been validated?

Lionetti: Not in the sense that you will see ADA brigades being organized in other divisions. There just isn't enough HIMAD in our Army to dedicate a Hawk battalion in the direct-support role to each division.

Air Defense Artillery: What is the future of the command?

Lionetti: DIVADA will either inactivate when the transition of the 9th Division is completed by FY86, or the DIVADA may convert to a corps ADA brigade as part of the Army of Excellence initiative recently announced by the Army chief of staff.

Air Defense Artillery: Would the new brigade then get out of the high-tech business?

Lionetti: I hope not. Our light force ADA modernization initiatives won't be finished by the time the corps ADA concept is finalized. Much work will continue in the developmental process. If the DIVADA converts to the I Corps ADA brigade at Fort Lewis, I can envision a close relationship with ADEA and a continuation of the modernization effort.

Air Defense Artillery: It sounds as if you're expanding your focus beyond that of the 9th Infantry Division.

Lionetti: It's a must with the Army's new emphasis on light force development. All associated ADA units will require modernized systems and concepts. When it comes time to buy the hardware, application across all light

9th Infantry Division Commander

I am pleased to have this opportunity to express to the air defense artillery community my views on the importance of air defense to success on tomorrow's battlefield.

There can be no question that the air threat facing our light to heavy forces could, if ineffectively opposed, reduce available combat power. Air Defense Artillery, therefore, is vital to the success of the maneuver arms. We are confident in your readiness, training, devotion to duty and your ability to make significant contributions on today's battlefield—you are now, and must be in the future, an integral part of the combined arms team.

The battlefield of tomorrow will demand of all branches the same innovative approach air defenders have always exhibited. Today, we can expect our potential adversaries to enjoy numerical superiority in almost all areas. Moreover, the quality and technology of their weapons and tactical skills are steadily increasing. To counter this growing threat, the Army has published and continues to refine AirLand Battle Doctrine. In future conflicts we must attack our opponent where he is weak, where we can inflict maximum damage for minimum loss. All arms must embrace this doctrine, analyze those stated and implied tasks within functional areas, and then evolve the tactical, organizational and equipment responses necessary to win. Training techniques must be developed to ensure our soldiers and leaders are supremely prepared to perform their missions. New weapons and equipment which are smaller, simpler and yet much more effective than today's must be developed expeditiously to support maneuver forces.

In all of these endeavors we must have the courage to break with tradition. Our approach must be to challenge the old ways and old thoughts in all of the facets of equipping, organizing, training and fighting. This is not to imply the out-of-hand rejection of all of today's ideas and methods, but rather to say that we can afford to leave no stone unturned in preparing for the future. We cannot reject new ideas because of the old bromide, "We've never done it that way."

An innovative, can-do spirit has always been a hallmark of Air Defense Artillery. The air defenders of the 9th Division Air Defense Artillery and the Army Development and Employment Agency have been trail blazers in this process at Fort Lewis. The articles in this section describe their extraordinary progress. You are invited as a community and as individual professionals to work with them to further enhance the defense of our forces.

Again, no mission of today's or tomorrow's Army is more critical. As a branch and as individuals, you must accept the challenge of change and innovation presented today for tomorrow's battlefield.

Robert W. RisCassi
Major General, USA
Commanding

forces will provide the volume to make the buy efficient.

Air Defense Artillery: Any final thoughts?

Lionetti: Divisional air defense is where it's at. It's great being an integral part of the combined arms team. We're moving fast, we're ready. That you can bet on!

A Stinger mounted on a high-mobility, multipurpose, wheeled vehicle waits outside the 9th DIVADA headquarters.

MAJ Robert Perceval, 9th Infantry Division public affairs officer, interviews COL Donald M. Lionetti, 9th DIVADA commander. (Photo by MAJ Robert Curran)

9th Infantry Division Command Sergeant Major

I feel privileged to have the chance to add a few lines to *Air Defense Artillery's* series of articles on the 9th Division Air Defense Artillery.

While serving as DIVADA command sergeant major for almost four years and in my current job as command sergeant major of the 9th Infantry Division, I've been fortunate to witness the most dramatic changes in our soldiers, leaders and the quality of our profession

Change is our middle name at Fort Lewis, and change is good. Soldiers at all levels are involved in helping design and evaluate this division's organization and the weaponry it will fight with. Are our soldiers up to it? You bet they are because, according to my observations, soldiers have changed too. Today's soldier is smarter, more trainable and more motivated. They are an absolute pleasure to be around. Non-commissioned officers have changed too. We're serious about our profession, demanding and getting more responsibility, and we are truly having an impact in honing the individual and collective skills of our soldiers.

I'm happy to report the contributions of NCOs and junior enlisted men to the combat readiness and modernization of the 9th Division are significant. I'm confident the spirit will be sustained. It's a great place to soldier.

Ralph L. Phillips
Command Sergeant Major
9th Infantry Division

(CSM Phillips is the only air defense artillery soldier serving as command sergeant major of an infantry division.)

MAJ Robert Perceval, *the 9th Infantry Division public affairs officer at Fort Lewis, Wash., holds a bachelor's degree from the University of Texas at El Paso. He has served in various platoon, company and battalion level positions and as an instructor in the Tactics Department, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

WHO'S NEWS

One of ***Defense Secretary Caspar Weinberger's*** stops between Paris and Brussels last winter was a visit to the tactical site of Battery C, 3rd Battalion, 60th Air Defense Artillery. During his 25-minute stay at the site, Weinberger watched unit members go through crew drills and was briefed on the mission of the Hawk unit, then in the middle of a tactical evaluation exercise.

The secretary of defense was accompanied by ***GEN Glenn K. Otis,*** USAREUR commander, and a group of about 30 reporters and photographers. ✱

SSG James C. Jeffers of Battery B, 3rd Battalion, 71st Air Defense Artillery, recently was recognized by German police for aiding three accident victims. An award was presented by two German police officials for Jeffers' actions on Oct. 20, 1983. On that day, Jeffers was driving to work when he was waved down by a man on the roadside. The man said there was an accident and an ambulance and *polizei* were needed.

Jeffers summoned help and returned to the scene to find a car smashed against a tree. He pulled one person from the vehicle but he didn't move the other because he didn't want to cause further injury.

The NCO also spotted a girl lying on the ground, apparently thrown from the vehicle. He performed first aid on the three and treated them for shock, comforting them as best he could.

"I didn't think of what was going on," Jeffers said. "I did what I had to do." ✱

The School Brigade at Fort Bliss, Texas, was the first recipient of the ***Manny Cintron Humanitarian Award*** which was given at the seventh annual El Paso Foster Parents Appreciation Banquet for the brigade's long-term involvement with the city's foster children. For the past nine years, The School Brigade has given a Christmas party for the children and their foster parents.

The man responsible for the party's success is ***CSM Donald C. Olesinski.*** The brigade commander, ***COL Claude Ellis Jr.,*** is understandably proud of the job done by Olesinski and other members of the brigade. "I was very happy for the unit and pleased as a commander to accept the award on behalf of the brigade. I feel really good that we can help the community and that they recognize our efforts." Ellis also said that he felt the award was a good reflection on the military as a whole. ✱

DEADEYES—Soldiers from Battery B, 1st Battalion, 55th Air Defense Artillery, Fort Polk, La., display the wings of a "Soviet" aerial target. The Vulcan gunners each shot down one drone at the National Training Center, tying the NTC record for aircraft shot down by a unit rotation. The air defenders are (from left to right) ***SGT Roy Banks, SP4 Albert Norwood and SGT Anthony Murray.*** (U.S. Army photo by SP4 Ernie Dontis) ✱

Miss Texas, ***Laura Shaw,*** demonstrates just how beautiful a Redeye air defense missile system can appear as she toured through the Air Defense Artillery Museum during a recent visit to Fort Bliss, Texas. (U.S. Army photo by SSG Dave Butler) ✱

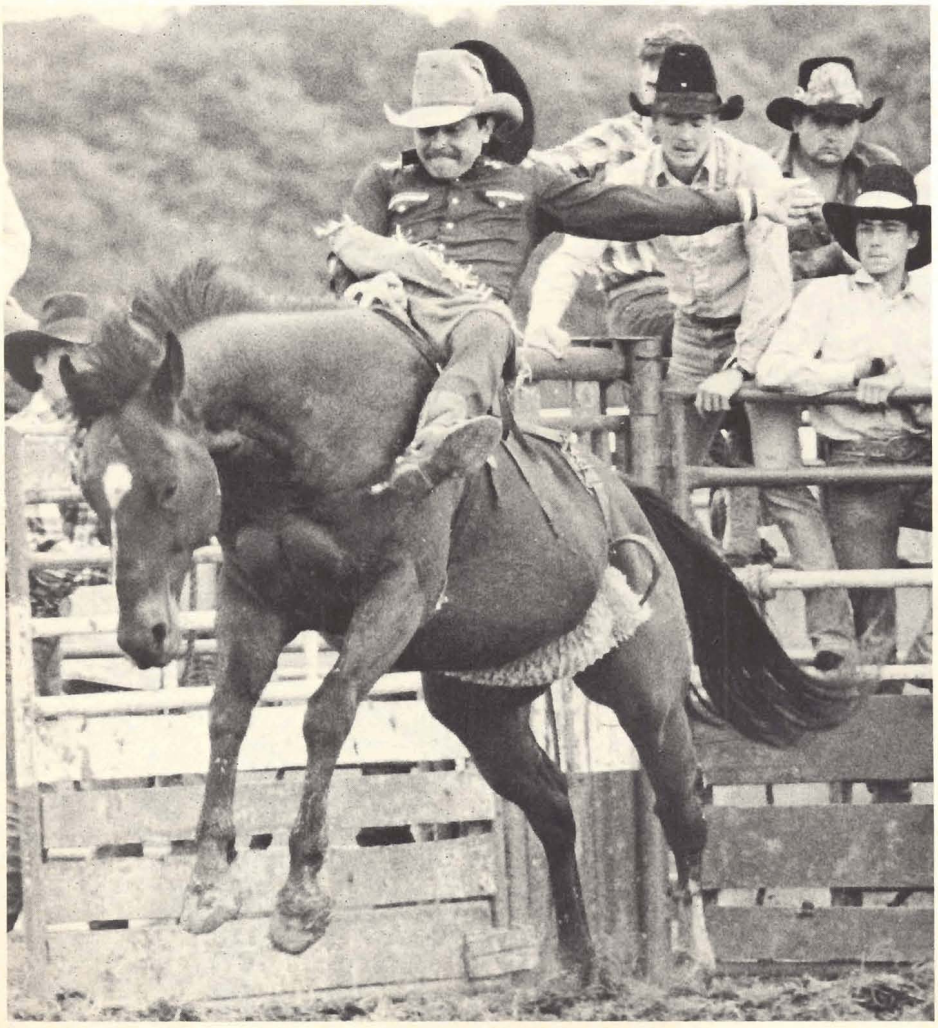
CPT Alan D. Landry and ***1SG James E. Walthes,*** both assigned to the 11th Air Defense Artillery Brigade, Fort Bliss, Texas, recently accepted General of the Army Omar N. Bradley Awards after being named Association of the U.S. Army officer and NCO of the year. The Omar N. Bradley Chapter of the AUSA gives the annual award to the officer and NCO who best exemplify the qualities that made the late general a great leader. ✳

CPT Alan D. Landry accepts the General of the Army Omar N. Bradley Award from MG James P. Maloney, U.S. Army Air Defense Artillery School commandant. Landry was selected U.S. Army Officer of the Year.

SSG Jerry Stewart of Headquarters Battery, 2nd Battalion, 62nd Air Defense Artillery, rides Lufthansa to victory in an event sponsored by the European Rodeo Cowboy's Association. Stewart took the association's best overall award in 1983 by earning firsts in bareback and saddle-bronc riding and second in team and calf roping. His wife, ***Caroline,*** took the barrel-racing title for the season.

On a typical weekend, the Stewarts ride a hundred miles or more to an event, helping other rodeo riders set up the association's arena upon arrival.

"I rode in almost every rodeo in 1983," said Stewart. "Some I couldn't make because duty comes first, but most of them I go to because I have good support from my commander." ✳



Working part-time for Armed Forces Network in Kaiserslautern, Germany, propels ***PFC Dawn Cunningham*** towards her goal of "getting my foot back into the door of broadcasting." Before Cunningham was assigned to Headquarters Battery, 94th Air Defense Artillery Brigade, she worked for radio station KSXX in Salt Lake City, Utah.

Now Cunningham works as a word processor operator during the day, but usually at night and on weekends she's at the radio station putting songs on tape cassettes and taping the "Swap Show" program for the station.

"It's been two years since I was in broadcasting," said Cunningham. "Now I'm relearning what I knew." ✳

The ***1st Battalion, 7th Air Defense Artillery, 11th Air Defense Artillery Brigade*** has been named winner of the 16th Annual Philip A. Connelly Award competition for best TRADOC field dining facility in 1983.

The unit, which was runner-up in the 1982 competition at the TRADOC level, will now compete for top Army honors as it enters the All-Army finals.

Members of the facility are ***SFC James Stieb, SSG Kenneth Smith, SP4 Diaz Ramos, SPR Gloria Howard, SP4 David Marcoux*** and ***SP4 Dennis Tebay.***

Opinion

Military vs. Contractors

A Time For Open Dialogue

by Michael Conley

The two greatest delusions in the world are:

- I am a government project officer, and I wish to answer all of your questions completely.
- I am a contractor, and I am here to help you in your best interests.

Both statements are true, but the perception that they are delusions permeates today's military acquisition process. To everyone's great dismay, this is not in the best interest of industry and, more important, not in the best interest of the government.

I am an advanced systems engineer for a leading developer of military command and control systems. I am also a project officer for the Army during my Reserve time and wish to present a perspective of the acquisition process from both sides of the fence. After 10 years of full-time military service as an air defense artillery officer, I lean considerably toward the interests of the green suit. Please be assured that this is not the third greatest delusion.

Industry today, more than ever, is dedicated to providing the finest product in accordance with the user's desire. This wins programs, which is the name of the game. To produce such products, industry divides its advance programs' monies into two categories. One is independent research and development; the other is bid and proposal. The former category is designed to pursue long-term (three years or longer) advanced technology concepts that have a clear potential to eventually become a government contract. The bid and proposal category is designed to respond to programs for which the government has decided to award a competitive contract. These monies, in the long run, will be passed on to the government because that's how companies that produce government products develop and sustain a product base and stay in business. These are legitimate business costs that are passed on to the government. Let's consider how these monies can be spent in the government's best interest.

In both cases, the contractor's understanding of the user's concerns and ideas is directly related to the quality of the product. Remember, this product quality is not just a function of money which, no matter what, will still be spent if the company perceives a contract is inevitable and that a good chance to win that contract exists.

It all sounds so easy and uncomplicated. So what possibly could be the problem? As fairly as I can say this, the problem is comparative to the Berlin Wall—the wall that separates and prohibits the East from coming to the West. Simply put, in an effort to prevent a conflict of interest or unfair competitive advantage by any single industrial firm, the government's position, many times, is to release a minimum of information relating to the program prior to the release of a request for proposal. A request for proposal is an official government specification that describes an item or service to be produced or provided. This reluctance to provide information puts the wall in place. Who will benefit most?

The contractors? Hardly. They now must resort to industrial intelligence and rumor control. They also must now spend large sums of money to prepare a highly technical staff to respond to a specific project. This cost will be absorbed by the government. Realistically, it takes a minimum of nine months to a year to properly answer what the contractor thought to be the government's desires. Unfortunately, it often ends as a frustrating guessing game. No matter how good these professionals are, the product quality is only as good as the data base they start with.

The government? Not so, either. I believe members of the government think that holding back information is in their best interests. And this is the problem. Their rationalization is that if no industrial firm is given information prior to the request for proposal release, no unfair competitive advantage can be gained by a single company. Withholding cost and specification data from industry allows too short a response time (normally 60 to 90 days) to the request for proposal to effectively address established technical, logistical, training and cost issues. As I said before, the process normally takes nine months to one year. To make matters worse, the request for proposal often differs significantly from what industry perceived the requirement and specifications to be. So, industry has to "change horses" in midstream, and all work completed up to that point, even though beneficial, is far from sufficient to prepare the best response to the government's request for proposal. The end result is a quality-reduced design that the government must choose for contract award. This eventually relates to a less than optimal product to the field. The soldier is the ultimate loser in this acquisition methodology.

Are we between the proverbial rock and a hard place in attempting to prevent an unfair competitive advantage or, in reality, can this be turned to the government's favor? The opportunity to eliminate this dilemma exists by stimulating the competition instead of suppressing it. To do this, government project officers should be given the freedom to discuss all aspects of a program with any and all contractors with the understanding that these exchanges would represent the government's best position on a given project and would not be binding until a request for proposal is issued, at which time the requirements will be fixed. Industry, being competi-

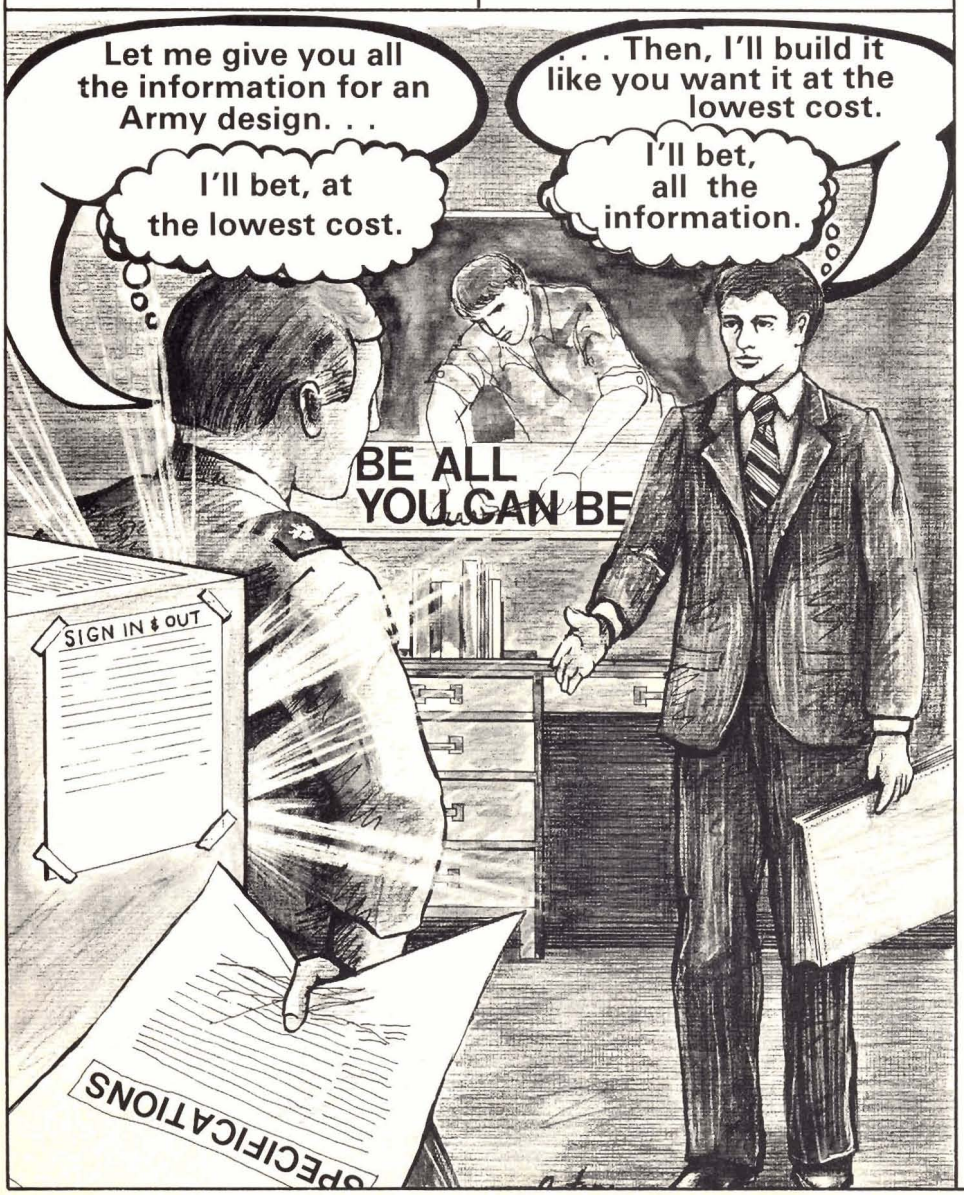
tively motivated, would gather this information directly proportional to their desire to gain a competitive advantage. Gaining this competitive advantage is the basis for American ingenuity and should not be hindered, but encouraged, if the best product is the desired result. And to be honest, the best product is the overriding goal of an Army project officer. He is the person who takes an idea from the soldier, puts it to paper and brings it to life. He struggles with it when it needs to be changed, fights for it when it is in trouble and lets it go when he can do no more for it.

If one firm gathers more data than the next, this is not a shortcoming of the government, but of industry. The responsibility to establish a relationship and gather this data would shift to industry and would be accomplished to the degree they desire to win the contract. I believe you will find this desire to be as driving as the project officer's desire to watch the program grow. In turn, this will certainly demand more of the project officer's valuable time earlier in the life cycle of a program. But if our goals are the same and this methodology will help in achieving them, then this would be part of the job, not an additional duty. In the long run, the project officer's valuable time will be saved if an active interchange would educate him to possible solutions and better system specifications with fewer changes later.

A caution, though, if this active interchange is born. The project officer's definition of a program should be as specific as possible and must meet the Army's needs in accordance with doctrinal philosophies. You might think that this could go without saying, but have you ever seen a kid with no limitations in a candy store? Industrial high-tech candy stores offer far more than the requirements or needs of the soldier. A project officer's firm and accurate account of the user's requirements will be needed as a driving force to most efficiently guide industry without costly excursions. Also, education of project officers in industrial operations and limitations would enhance and optimize this relationship. Maybe a civilian counterpart program to the Reserve officer program could be initiated. A partnership of this kind would strengthen the project officer to be an effective representative of the government. In turn, industry would have a qualified individual to work with in a most responsive manner.

The bottom line is that we, the government and industry, are in this together and both sincerely desire the best product for the soldier at a fair price. It is a hard cold fact that industry must make a profit, but this is not industry's only purpose. Caring about the soldier's ability to accomplish his mission is not a feeling reserved for government employees only. Industry genuinely cares too.

I think it is time to put aside our perceptions and procedures which hinder industrial development and frequently give a less-than-desirable product to the soldier. It is time to establish a new era of cooperation. The ideas that I offer are certainly not the ending, but the potential beginning of this era to change the "two greatest delusions" into the "two greatest truths." ✱



Michael Conley *is an advanced systems engineer for a leading government developer of command and control systems and a captain in the Army Reserve. His Regular Army career of 10 years as an air defense artillery officer ended in 1982 at Fort Bliss, Texas, where he was a C³I project officer for the Directorate of Combat Developments. He holds a bachelor's degree in aerospace engineering from the University of Texas at Austin.*

Scanning

U.S. Air Force Decides On Stinger

The Air Force has decided to use the man-portable Stinger for its ground-based point air defense.

Stinger was chosen because of its high effectiveness against high-speed maneuvering aircraft as well as against slow or hovering helicopters. The system's reliability also was a high factor in the decision.

At a unit cost of approximately $70,000, including training and support equipment, the Stinger represents an extremely cost-efficient point air defense system. Air Force officials also cited Stinger's maintenance-free design which affords a minimum 10-year storage life without degradation of performance.

The Air Force intends to line up the necessary support for the weapon by using the existing Army logistics system, including facilities, equipment and procedures. Officials stressed that the Air Force's goal is to deploy Stinger with little or no duplication of Army efforts.

Marines Complete Transition To Stinger

The Marine Corps has completed its transition from Redeye to the Stinger missile system. Forward area air defense batteries at Okinawa, Cherry Point, N.C., and Camp Pendleton, Calif., are now equipped with Stinger. Since procurement is not yet complete, Redeye missiles are still in the inventory and will be used as backups and for training.

Marine Corps officials are now considering a helicopter-mounted version of the Stinger. *(Marine Corps Gazette)*

Night Sight For Stinger

The Army is developing a thermal weapon sight that will be used on individual and crew-served weapons. As envisioned, these compact, lightweight night-vision devices would be applied to anti-tank weapons, infantry surveillance equipment and the Stinger weapon. It could also be mounted on jeeps or in rotary aircraft. The system that will be used by Air Defense Artillery is known as the Stinger Nite Sight.

Testing of two prototypes, built by Rockwell International and Hughes Aircraft, is scheduled to begin this summer. The Stinger portion of the test will take place at North McGregor Range, Fort Bliss, Texas, in early summer 1985.

Performance benefits of the thermal weapon sight include operation in total darkness, passiveness and improved obscurant penetration. Operational benefits are that it is self-contained, is automatic, has fire-and-forget line-of-sight, is completely electronic and requires no cooling bottles, has interchangeable telescope lenses that can be changed for different applications and has remote video for classroom instruction.

The Night Vision Electro-Optics Laboratory, Fort Belvoir, Va., is managing the program.

New Radar System Incorporates A-STAR

Undersecretary of the Army James R. Ambrose directed that the requirements of the airborne SHORAD target acquisition radar, known as A-STAR, be incorporated in a joint Army-Air Force program called JSTARS, joint surveillance and target attack radar system. *Air Defense Artillery,* Spring 1983, defined the A-STAR concept.

The JSTARS program, which will replace the Army stand-off target acquisition system and the Air Force Pave Mover program, will be incorporated in the Army 21 (formerly AirLand Battle 2000) Doctrine. Army 21 Doctrine calls for penetration of enemy defenses up to second echelon forces. The new radar will ultimately locate and track enemy targets and will contain a weapons control update system.

The Army JSTARS is a pod-mounted radar currently planned for installation on the OV-1 Mohawk aircraft. Air Defense Artillery's requirements call for alerting-quality data that gives azimuth and range for SHORAD gunners to look in a 30-degree sector.

JSTARS data interoperability requirements are still being defined. A future article detailing JSTARS is forthcoming in *Air Defense Artillery.*

SGT YORK Training Postponed

All SGT York training courses have been postponed because of delivery delays of SGT York fire units, training devices, software and training aids. Tentative start date for advanced individual training is November 1984 with the other courses falling in line beginning January 1985.

Courses involved are 24W (system mechanic) OSUT and Transition, 224DO (organizational system technician), 16L (crewman) OSUT and Transition, 14B Officers Course and 1st Battery Collective Training.

Career

Language Students Wanted

The Army is looking for men and women to attend language training. Soldiers who meet the prerequisites for enrollment as outlined in Chapter 4, AR 611-6, Army Linguist Program, can volunteer for the training by submitting the required documentation to the U.S. Army Military Personnel Center, Alexandria, Va.

Air defenders in CMF 16 (Air Defense Artillery) who are interested in learning Italian are sought. The language code for Italian is JT.

Selectees will attend training at the Defense Language Institute's Foreign Language Center at the Presidio of Monterey or the Presidio of San Francisco, Calif., or at the State Department's Foreign Service Institute in Arlington, Va.

Additional information can be found in the DA Circular 350-series. Soldiers can contact their local military personnel office or call MILPERCEN at AV 221-8415/0640, commercial (202) 325-8415/0640 for further details. *(ArNews)*

Army Needs More Divers

Male soldiers interested in serving as construction divers and who meet the qualifications may apply for the MOS. Construction divers provide surface-supplied (hard-hat) and scuba diving in support of port construction, rehabilitation and construction of submarine petroleum pipelines, vessel maintenance and salvage operations.

Applicants must meet a number of requirements ranging from physical and mental tests to age and length-of-service time. The specialty is closed to women soldiers.

Interested soldiers may request a list of the requirements by writing to both of the following agencies:

- For personnel requirements—MILPERCEN, ATTN: DAPC-EPL-E, 2461 Eisenhower Avenue, Alexandria, VA 22331.
- For medical requirements—Surgeon General of the U.S. Army, HQDA, ATTN: DASC-PSP, Washington, DC 20315.

Weight Standards Policy Clarified

Army personnel officials have answered some recent inquiries about the policy on re-enlistment or extension of pregnant soldiers who are going overseas or who are transferring in conjunction with joint domicile.

Officials cite the AR 600-9 requirement that pregnant soldiers who exceed the acceptable prescribed weight standards at the time of re-enlistment be excluded from re-enlisting and may not be extended for more than six months past the expected delivery date of the child. After delivery, those soldiers affected by the restrictions may re-enlist or extend as soon as they meet the screening-table weight or the prescribed body-fat content. This policy applies regardless of whether the six-month period has elapsed since delivery.

Any questions about the new policy may be answered by local re-enlistment personnel. *(ArNews)*

Jobs Available With Roland

The New Mexico Army National Guard has more full-time job openings in the newly organized Roland battalion located at McGregor Range, near Fort Bliss, Texas.

The 5th Battalion (Roland), 200th Air Defense Artillery, under command and control of the New Mexico National Guard's 111th ADA Brigade, headquartered in Albuquerque, N.M., consists of 27 fire units. Since July 1983, 68 positions have been filled and 245 more will be announced through January 1985. These vacancies will open at a rate of 60 positions every three months. Positions becoming available include squad leaders, senior gunners, gunner-drivers, platoon leaders, platoon sergeants and senior mechanics.

Applicants must have the following prerequisites to qualify: basic training, advanced individual training, report of medical examination (SF-88), report of medical history (SF-93), report of discharge or transfer (DD 214), appropriate school diplomas, degrees, letters of commendation and other documents that provide qualifications for a job with Roland.

Full-time members of a Roland unit receive full active duty military pay, retirement and other benefits. Duty assignment is permanent with no transfers authorized into the Regular Army.

For more information, call WO1 Jim Aragon at the National Guard Headquarters in Santa Fe, N.M., (505) 473-2482, or CW4 Rudy Triviz or 1LT Dwight Patton, Fort Bliss, Texas, AV 978-9406, commercial (915) 569-9406.

New Drug Policy Includes E-5s

Army officials announced that E-5s who are identified as drug abusers may face immediate separation from the Army. The original policy said officers and senior enlisted, E-6 and above, would face separation proceedings if they were identified as drug abusers, and all other soldiers would face the same if they were "second-time" abusers or found to be drug dependent.

The decision to include E-5s into the "no second chance" category gives evidence of the Army's standard of non-abuse among leaders at every level of the chain of command. It also reinforces the commitment of the non-commissioned officer corps to uphold this standard.

The change in policy has been implemented in appropriate changes to AR 600-85 and AR 600-200.

This change, however, does not mandate separation of all identified drug abusers. The decision will be left to the appropriate designated separation authority. *(ArNews)*

Promotion Information

Soldiers often wonder why promotion point cutoffs for their MOS are so high. There is a reason for cutoff scores being high or low, and there is also a way soldiers can get faster promotions, according to MILPERCEN Promotions Branch personnel.

The total number of promotions for each grade, regardless of MOS, is decided by comparing the number of personnel authorized in that grade against the number allowed by the Army's budget. The personnel authorized include losses, soldiers promoted in and out of the grade and reductions. In addition, new equipment or training developments drive the needs for certain MOSs to go up and down.

Promotions are given first to the MOS with the greatest personnel need. When MOSs are overstrength, the cutoff scores for promotion points are raised. Understrength MOSs have lower promotion point cutoffs.

DA Circular 611-83 lists which MOSs are understrength and which offer selective re-enlistment bonuses. Unit re-enlistment NCOs can give information about reclassifying to a different MOS. They also can advise on selective re-enlistment bonuses which change monthly.

Contact your local military personnel office for more information about the promotion system.

Overstrength Skills Promotions Permitted

A new Department of the Army policy will permit at least one monthly promotion to E-5 in overstrength skills that have been firmly shut for more than a year. The Army had been effectively denying promotions in overstrength MOSs by setting the monthly test cutoff scores so high that no one qualified, regardless of standing on local promotion lists. Now, in each of the overpopulated skills, the soldier with the highest monthly test score is promoted.

Whether the new policy will be extended to E-6 promotions is still not known. Above that rank, promotions are centralized.

Physical Tasks Being Reviewed

An appendix to AR 611-201 (Enlisted Career Management Fields and Military Occupational Specialties) that will be used to list the physical tasks associated with each MOS by skill level is being developed. This appendix will help commanders and medical officers determine the need for MOS reclassification because of physical limitations or impairment. It will also assist in selecting a suitable MOS for reclassification of soldiers no longer able to perform their MOS responsibilities. These listings are not intended to be all inclusive; they are to provide a general overview to assist those not familiar with each MOS to gain a better understanding of the demands of each specialty.

Patriot Warrant Officers Needed

Applications for warrant officer MOS 222C (missile system technician, Patriot) are being accepted throughout FY84 from soldiers who are eligible for appointment in accordance with AR 135-100. The mandatory eligibility criteria listed in DA Circular 601-83-2, Warrant Officer Procurement Program FY84, will apply until publication of the FY85 procurement circular.

The last selection board for FY84 will convene in August. Applications must be received not less than 30 days prior to the board month. Receipt of application at Department of the Army will be acknowledged by DA Form 209, if DA Form 200 was forwarded with the application. Any change in an applicant's status must be reported through appropriate channels to Headquarters, Department of the Army. Changes of address should be sent by DA Form 3955 or DA Form 209.

Commanders and supervisors are urged to encourage outstanding soldiers to consider submitting applications.

The warrant officer appointment section office symbol and telephone numbers are: DAPC-OPP-PW, AV 221-9667 or 9728, commercial (703) 325-9667 or 9728. *(MILPERCEN)*

Developments

New Rangefinder To Be Developed

(Photo courtesy of Hughes Aircraft Company)

Soldiers will someday have a new eye-safe laser rangefinder to pinpoint the range of targets. A competitive contract for development of the mini eye-safe laser infrared observation set was awarded to Hughes Aircraft Company's Electro-Optical and Data Systems Group to build 12 development models for the U.S. Army Night Vision and Electro-Optics Laboratory. A mock-up of the lightweight laser is shown above. The set consists of a rangefinder, tripod, battery, carrying case, shipping case and lens cleaning kit.

Electromagnetic Energy Study Contracted

The Army awarded an $11-million contract to a small business in Michigan for research on atmospheric factors which affect the propagation of electromagnetic energy.

Optimetrics Inc. of Ann Arbor, Mich., received a five-year contract to study both natural and battlefield-generated environmental factors which affect the performance of electro-optical and directed-energy weapon systems. The research requirement was initiated by the Atmospheric Sciences Laboratory of White Sands Missile Range, N.M.

The purpose of the study is to find ways to lessen the effect of those atmospheric factors which degrade a weapon system's performance on the battlefield. The systems affected include high- and low-energy laser systems, imaging systems and seeker/guidance systems. Natural conditions such as fog, rain, snow and dust will be considered as well as battlefield-induced conditions such as smoke and burning debris. Optimetrics will research how the systems are degraded and develop methods to compensate for the degradation.

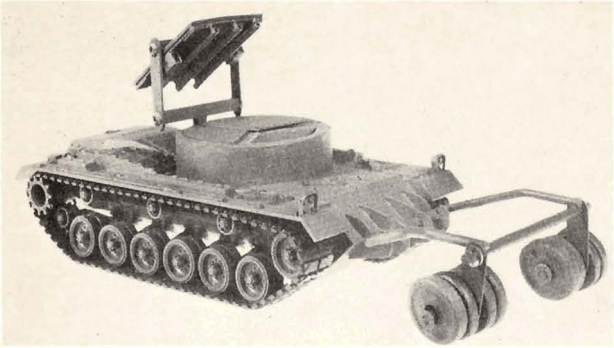
New Anti-armor Missile System Proposed

(Photo courtesy of Hughes Aircraft Company)

During training exercises at Fort Irwin, Calif., soldiers simulated the operation of a newly proposed anti-armor missile system. The new weapon would use a focal plane array infrared seeker and tracker being developed by Hughes Aircraft Company for the Tank Breaker Technology Program. The proposed missile would be supplied in a throwaway launch tube that also serves as a storage container. The complete system, including the missile, would weigh less than 35 pounds.

The Tank Breaker Technology Program is funded by the Defense Advanced Research Projects Agency and managed by the U.S. Army Missile Command.

Mine-clearing Tanks To Be Built



The U.S. Army Tank Command will soon begin fabricating two prototypes of a remote-controlled, mine-clearing vehicle now under development.

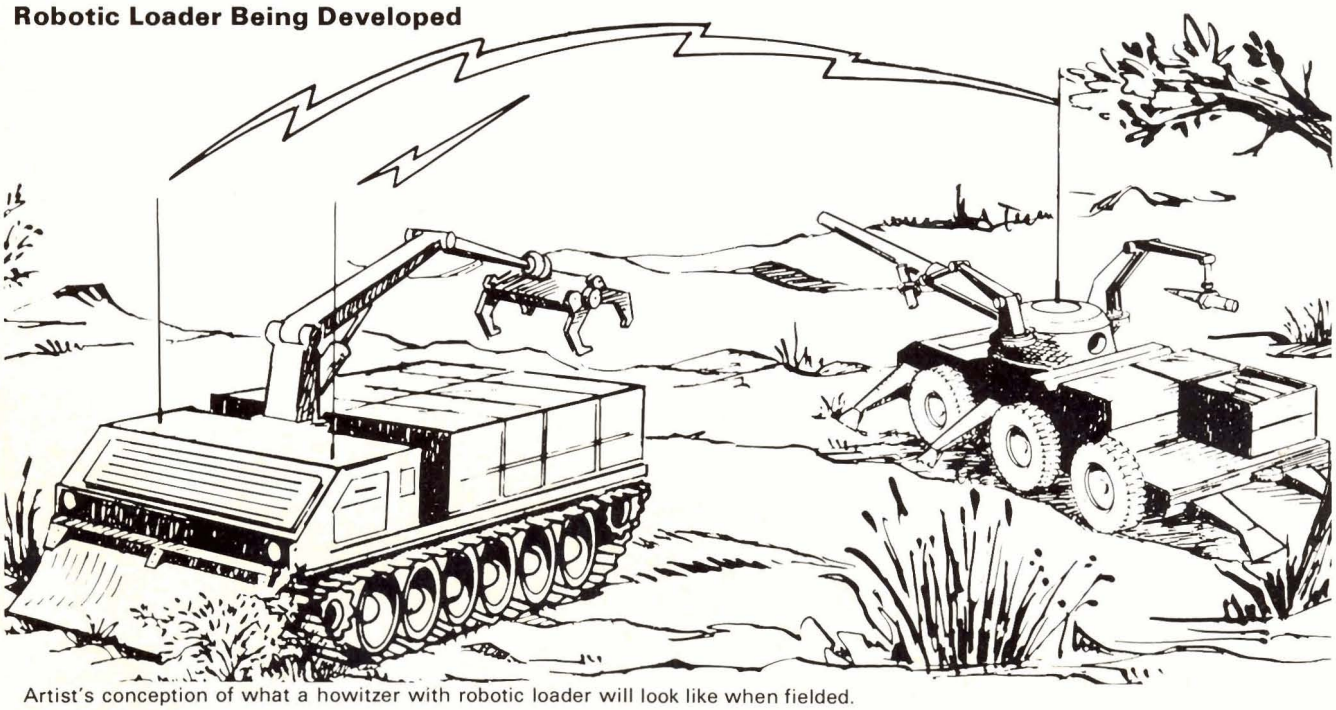
The vehicle, referred to as the robotic obstacle breaching assault tank, will accompany assault forces and destroy mines by launching rocket-propelled lines of explosives into mine fields. Upon landing, these explosives will detonate sequentially across the mine field and cause nearby mines to explode, clearing a path for other vehicles.

The Army does not have a vehicle designed for mine-clearing in its inventory. Assault vehicle crews have had to rely on combat engineers using hand-held metal detectors and bayonets to locate mine fields.

When the prototypes, developed from modified M-60A3 tanks, are completed in about a year and a half, they will undergo six months of testing at Aberdeen Proving Ground, Md., and Fort Knox, Ky. When one of the concepts is selected, the Anniston Army Depot, Ala., will produce 142 mine-clearing vehicles for immediate deployment.

The project is part of a joint effort of the U.S. Army Engineer School and the Belvoir Research and Development Center, Fort Belvoir, Va., and the U.S. Army Armor and Engineer Board, Fort Knox.

Robotic Loader Being Developed



Artist's conception of what a howitzer with robotic loader will look like when fielded.

A howitzer robotic loader is in the exploratory development stage at the Armament Research and Development Center's Large Caliber Weapon Systems Laboratory, Dover, N.J. When completed, the loader will be able to handle projectiles in excess of 100 pounds, and the resupply loader up to 500 pounds so it can lift three projectiles at once. Most commercial robots can only handle up to 60 pounds.

If fielded in the 1990s as expected, the loader will speed up the loading process by mechanically transferring projectiles and charges from a resupply vehicle to the howitzer and from the interior loading racks of the howitzer into the gun. At present, soldiers must manually load the 155mm projectiles which weigh more than 100 pounds each.

Engineers have recently built a miniature robotic loader that has the same configuration as the envisioned full-size loader. It consists of a

computer-operated metal gripper that operates like an overhead crane. The arm apparatus hangs above a mock wooden howitzer loading tray which has a propelling-charge rack on its left and a projectile rack on its right.

The most important feature of the loader is its computer program that receives the mission requirements and "decides" where the gripper must go to load the gun. It also decides what size charge is needed to execute the firing order. This software, together with specially designed hardware, provides the intelligence for the complete weapon system. While it is in principle merely a computer, the microprocessors will have greater data-handling capacity than those used in most industrial robotic devices.

In the near future, available commercial and newly fabricated parts will be assembled to make the first full-scale model. The howitzer robotic loader will weigh 1,500 pounds and have an arm about 40 inches long with a 30-pound gripper designed specifically to handle 155mm projectiles and charges. *(AMCCOM)*

Apache Completes Inaugural Flight

The first production AH-64A Apache anti-armor helicopter successfully completed a 30-minute maiden flight over the Arizona desert.

The jet-turbine-powered AH-64A is a quick, highly maneuverable helicopter. It is equipped with infrared, laser and other high technology systems to seek out and destroy enemy armored vehicles with precision in adverse weather, day or night. The Apache's primary weapon is the Hellfire laser-guided missile. It is also equipped with a 30mm M-230 automatic cannon.

During the flight, the helicopter reached a forward speed of approximately 120 mph and sideward and rearward speeds of 23 mph. Future flights will test the aircraft at its maximum forward airspeed of 230 mph and sideward and rearward speeds of more than 50 mph.

The Army plans to procure at least 515 AH-64As. Funding has been appropriated for the first 171 Apaches, including 112 for FY84. The first Apaches are due to arrive at Fort Eustis, Va., and Fort Rucker, Ala., in October 1984. The first AH-64A attack battalion will be formed at Fort Hood, Texas, during the summer of 1985, with subsequent deployment to Europe.

Intelligence

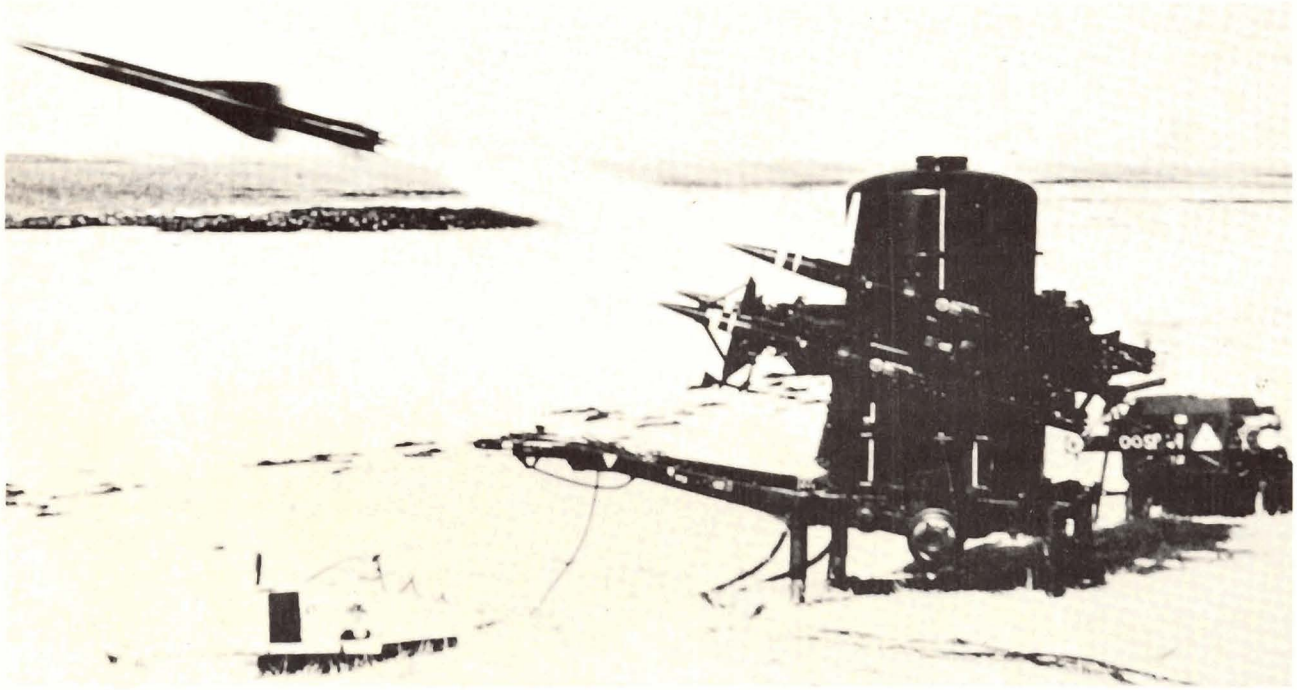
Soviets Display SA-13 Missile System

A recent photo of the Soviet SA-13 short-range air defense missile system shows the four-canister launcher mounted atop a BRDM2 tracked vehicle. The Soviets have fielded the system as a replacement for the SA-9 Gaskin.

Sources say the weapon has a range-only radar and can intercept a target four to five kilometers away at altitudes as low as 30 feet and up to 32,000 feet. It is believed that the system is equipped with passive radio frequency detectors and cooled infrared or dual-bank infrared seekers.

The SA-13 is used with the ZSU-23-4 anti-aircraft gun by motorized rifle and tank regiments as part of a Soviet trend toward modernizing SHORAD air defense systems and their command and control procedures. *(Aviation Week & Space Technology)*

First Rapier Delivered to USAF



The first British-built all-weather, low-level Rapier air defense system was delivered to the U.S. Air Force at Eglin Air Force Base, Fla., in October 1983. Plans are for three squadrons to be formed, initially manned by Royal Air Force personnel, to defend U.S. air bases in the eastern sector of the United Kingdom. A total of 32 Rapier fire units are to be deployed in this role within NATO.

The U.S. Air Force wants to extend the same arrangement for its bases in Turkey, especially since the Turks have said that they would man the systems if the U.S. Air Force buys them. Turkey recently bought Rapier for some of its own bases.

So far, 12 countries have chosen the Rapier system for air base defense.

U.S., West Germany Sign Air Defense Pact

The United States and the Federal Republic of Germany signed an air defense agreement that is expected to modernize and strengthen NATO's conventional defense of Central Europe.

The agreement calls for the following:

- The United States will provide West Germany with 12 tactical Patriot fire units, plus two additional units for training, maintenance and logistical support. These systems will be manned, operated and supported by the Germans as part of their forces.
- West Germany will procure from the United States 12 tactical Patriot fire units, plus two spare systems for training, maintenance and logistical support.
- West Germany will man, operate and support an additional 12 U.S.-owned Patriot fire units for 10 years in the 4th Allied Tactical Air Forces sector in southern Germany.
- West Germany will provide 27 Roland fire units for the defense of three U.S. bases in West Germany. These units will be manned, operated and supported by German Air Force personnel for 10 years.
- West Germany will procure 60 Roland systems, plus eight spare systems for training, maintenance and logistical support, to protect German operational air bases, some of which are are also used by U.S. forces.

The funding of this joint project will come from a balanced distribution of the financial expenditure between the two sides. The German personnel required for the Patriot and Roland units will be furnished by the German Air Force.

Jordanians Launch Hawk At Home

The Royal Jordanian Air Force successfully launched their first MQM-107 variable speed training target and Hawk missile on their own firing range at Al Jafr, Jordan. The firing was the first annual service practice conducted in Jordan.

The Hawk missile system has been operational in Jordan since 1978. In 1981, the Jordanian government built a firing range within the boundaries of its own country. Up to that point, the Jordanians conducted all firings at Fort Bliss, Texas, or in another country. The U.S. Army Missile Command was authorized, under a foreign military sales case, to buy the services and hardware to operate the range while Jordan designed and constructed the facilities. *(Redstone Rocket)*

F-16s Delivered to Venezuela

In December 1983, six F-16 aircraft were delivered to Venezuela, making it the first South American nation to acquire the aircraft. By the end of 1985, 18 "A" and six "B" versions will have been delivered to Venezuela.

In preparation to receiving the aircraft, Venezuelan pilots have undergone F-16 flight training at Luke Air Force Base, Ariz., and maintenance personnel have received training at the General Dynamics Corp. plant at Fort Worth, Texas.

Netherlands to Procure Patriot

An agreement was reached recently between the United States and the Netherlands for the procurement of the Patriot system.

Under the terms of the agreement, the Netherlands will procure, via foreign military sales, four Patriot fire units, each consisting of five launchers and a total of 160 missiles and support. Delivery of the first unit is expected to be in 1986, with one delivery per year thereafter. The first students will arrive at Fort Bliss, Texas, for Patriot training in late spring 1984.

Jacob de Ruiter, the Netherlands minister of defense, said that the $333-million purchase of the Patriot is needed to replace the aging Nike Hercules missile system and that no alternative new systems will be available in time to meet the Netherlands' requirements.

The Dutch expect the first Patriot squadron to be operational by the end of 1987. The other three squadrons would become operational at one-year intervals.

Japan Forms E-2C Unit

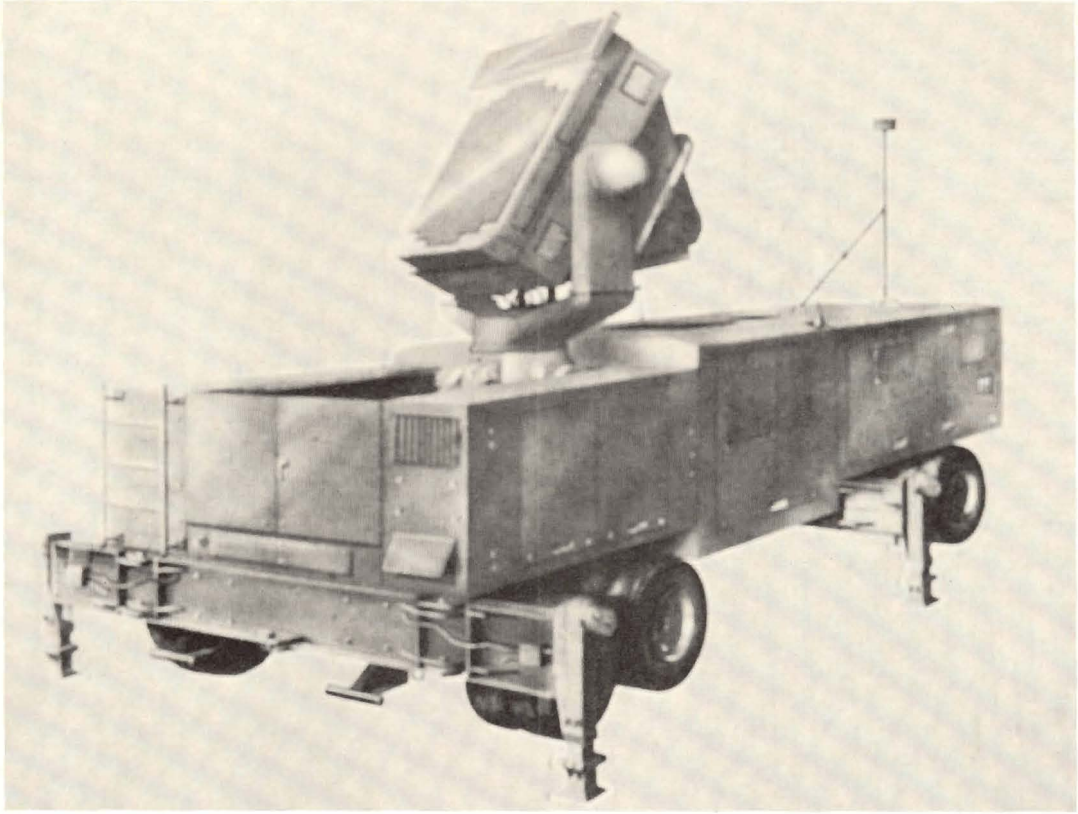
The Japanese Air Self-defense Force has formed its first E-2C airborne early warning unit at Misawa Air Base, north of Tokyo.

The unit has four E-2C aircraft and four more are on order for delivery in 1984 and 1985 to bring the provisional unit to full squadron strength by spring of 1986.

Egypt To Build Air Defense System

Egypt awarded a $210-million contract to Hughes Aircraft to build the first part of a new national air defense system. The contract calls for the integration of existing radars, missile batteries, aircraft, air bases and command centers into an automated command and control system. The newly acquired E-2C early warning aircraft also will be integrated.

France Seeks New SAM System



The French Defense Ministry has asked for feasibility studies on a future surface-to-air missile system. The land-based version would be designated SA-90, while the sea-based system would carry the SAN-90 designation.

The new system is to be tailored to counter the expected threats of the 1990s, including saturated attacks and supersonic missiles. It must also be able to operate in a severe electronic warfare environment.

Thomson-CSF is in charge of research for the radar and fire-control system, while Aerospatiale will conduct study work on the missile and launcher. An artist's concept of the phased array radar for the system is shown above.

Norway to Improve Air Defense

Norway has awarded a multimillion dollar production contract for 18 mobile radars and accompanying fire distribution centers for its adapted Hawk missile program. A single new mobile radar and fire distribution center will replace three radars and multiple control centers required by a standardly deployed Norwegian Improved-Hawk missile battery.

The acquisition radar and control system will consist of the new low-altitude surveillance radar and new computers and displays developed by Hughes Aircraft Co. and built by Kongsberg Vaapenfabrikk.

The low-altitude surveillance radar is a three-dimensional, short-range battlefield system which can automatically detect and track modern low-level threats such as heavily armed pop-up helicopters and high-speed, ground-hugging fixed-wing aircraft. Much of its hardware is derived from the AN/TPQ-36 Firefinder weapon-locating radar used by the U.S. Army and Marine Corps. However, unlike the AN/TPQ-36's fixed antenna that covers a 90-degree azimuth sector, the X-band low-altitude surveillance radar uses a mechanically rotated antenna to give 360-degree coverage. It uses phase scanning for elevation coverage and frequency shift.

The acquisition radar and control system is run by two operators, one to control the radar and one to provide the targeting information to Hawk missile batteries. Detection and targeting information can be forwarded to a variety of weapons and can be exchanged with other sensors by digital data communications.

BOOKS

BEAM DEFENSE: An Alternative to Nuclear Destruction
by The Scientific Staff of the Fusion Energy Foundation
Aero Publishers, Inc., Fallbrook, Calif., 1983. 176 pages. $7.95.

In President Ronald Reagan's television speech on March 23, 1983, he announced the establishment of a special commission to review the state of beam technology research. Subsequently, the scientific community has had heated debates about which areas of technology should be emphasized and funded to provide an effective missile defense system. Critics of directed-energy defense say that such weapons cannot provide a foolproof defense against a multinuclear missile attack. But the seven authors of *Beam Defense* say the opposite and go on to describe in detail what directed-energy technologies are available that make possible the development of defensive weapons that can knock out nuclear missiles in the first few minutes of their launch, preventing them from exploding.

The authors explain how these technologies work, how fast we can have them and how they would change the strategic situation, ending the era of mutually assured destruction. These include optical laser, X-ray laser, elementary particle, macroparticle, microwave and plasma beam technologies. They answer the most frequently mentioned objections to the development of beam weapons with scientific refutation and say that "it is useful to note that scientists who claim that beam weapons are impossible are at least five years behind in terms of the scientific literature and current experimentation."

The authors reveal that "all the beam weapon systems are much closer than most people think—realizable not only in this century, but some of them in this decade."

Equally important to defense, the book outlines how the development of beam technologies will bring us into the plasma age with the unlimited, cheap energy of fusion and the revolutionary applications of plasma technologies to industry, medicines and science.

This book is not a "Star Wars" fantasy but a revealing plunge into the world of beam technology and its application to national defense. It is recommended reading, especially for those who search for options to the mutually assured destruction stalemate. —*Claire Starnes*

THE PROFESSION OF ARMS
by GEN Sir John Hackett
MacMillan Publishing Co., Inc., New York, 1983. 240 pages. $24.95.

When the jacket of a book touts the time-worn phrase, "Soon to be a major motion picture," one questions which came first, the book or the film, the chicken or the egg? Sir John Hackett, who brought us the highly acclaimed but controversial *The Third World War: August 1985* and *The Third World War: The Untold Story*, has branched out into the realm of electronic media. *The Profession of Arms*, his latest literary effort, is "Soon to be a major six-part television series." Hackett will narrate as well.

The book may work better as a miniseries where poetic license can be abused and no one really cares. The fact remains, *The Profession of Arms* is neither fish nor flesh nor fowl. Strip away the photos and full-color plates (which account for a sizeable portion of the book) and the lengthy philosophical digressions and what is left is a thumbnail history of military men from the Spartans to present day. Unfortunately, even the historical aspect of this work is fairly banal, with few surprises even to the military layman. Quotations from Jean Foissart (The Battle of Crecy), The Recollections of Rifleman Harris, Winston Churchill and, ironically, George Bernard Shaw are far too long, serve as weak illustrations and seem to have been stuffed as padding into this mottled patchwork quilt.

Where Hackett fails mostly is in his departure into personal opinion towards the latter half of the book. His not always subtle attacks on Western philosophies of military professionalism are, at worst, bitter discourses on the decline of modern man. At best, they are cleverly disguised reminiscences into the past. Still, the illustrations make it worth having if only to place on the coffee table, and the miniseries is sure to create interest among the neophytes and uninitiated.

It has been said that every man has one good book in him. For Hackett, this one was not it.

—*Brian R. Kilgallen*

NUCLEAR WAR IN THE 1980'S?
compiled by Christopher Chant and Ian Hogg
Harper & Row, New York, 1983. 160 pages. Hardbound $19.95; softbound $9.95.

The detailed full-color photographs and drawings portray the imbalances of U.S. and Soviet-Warsaw Pact forces and the nuclear weapons in their arsenals. Descriptions of potential theaters of operation, U.S. and Soviet missiles and materiel, fallout shelters and effects of a nuclear blast echoes the often asked question: Is there life after Armageddon?

SMALL UNIT LEADERSHIP
by COL Dandridge M. Malone, USA (Ret.)
Presidio Press, Novato, Calif., 1983. 170 pages. $8.95

This is one of those "how to" books that no soldier in a leadership position should be without. Aimed

at NCOs and company grade officers, it is to the soldier what the "One Minute Manager" is to the businessman. The principles of good leadership are amply illustrated with true-to-life examples that can easily be understood by all.

THE DEMANDS OF HUMANITY
by Gaines M. Foster
Center of Military History, Washington, D.C., 1983. 188 pages. $5.

Originally conceived as a contribution by the Army Medical Department's Historical Unit to the nation's Bicentennial, this volume traces the manner in which Army doctors, nurses, enlisted specialists and medical supplies and equipment were used to relieve civilian victims of non-battle disasters.

The Demands of Humanity: Army Medical Disaster Relief traces such efforts from the earliest beginnings on America's western frontier in the 19th century to the Guatemala earthquake in 1976. Since the Army had never put this story together before, Gaines M. Foster, who began this project as a lieutenant on active duty with the Historical Unit, had to gather his data from widely scattered, often exceedingly obscure sources. The result is a fascinating chronicle of the ways American medical soldiers, always sensitive to suffering humanity, fought against disease, injury and death on civilian "battlefields," as well as on the fields of war.

Foster shows that the Army, always properly reluctant to get involved in areas where civilian authorities are supposed to have control, has usually been the only organization capable of rendering swift relief when national disaster overwhelms the civilians' abilities to respond. The author also places the Army's efforts in the context of the gradually expanding civilian bureaucracies to handle disasters. As the roles of the American National Red Cross, National Guard, Public Health Service and local and state health departments grew in importance, the Army's role diminished. Nevertheless, when quick response was needed, the Army responded, usually within hours.

The Army's most massive relief effort in this country was in the 1906 San Francisco earthquake. It makes fascinating reading, and so do Foster's accounts of the now largely forgotten American-Polish Relief Expedition to fight a monstrous typhus epidemic in post-World War I Poland (230,000 cases; 20,000 deaths), and the Russian famine relief effort in 1921 to 1923 conducted by six Army Medical Corps officers who set up an office in Moscow. After World War II, the Army sent field hospitals and medical troops (and often left the hospitals behind as a gift) to Pakistan (floods, 1954), Chile (earthquake, 1960), Iran (earthquake, 1962) and to other oversea and domestic disaster sites.

Foster's accounts from long-buried reports of half-forgotten military medical giants make entertaining and illuminating reading. AR 500-60, first published in 1924, makes the Army the agent of the Department of Defense for disaster relief. *The Demands of Humanity* shows that the Army Medical Department, with its expertise in public health and mass casualty management, stands always ready to respond to cries for help.

—COL Richard B. Stuart

THE THREAT: Inside The Soviet Military Machine
by Andrew Cockburn
Random House, Inc., New York, 1983. 338 pages. $16.95.

Does the "threat," as we know it, really exist? In *The Threat: Inside The Soviet Military Machine,* Andrew Cockburn attempts to untangle what he says are the realities of the Soviet threat and the U.S. reaction to it. He is confident that the "threat" is exaggerated both by the United States and the Soviet Union.

The author maintains that military and governmental elements of the superpowers purposely exaggerate the threat to achieve their own ambitions. "Military doctrine tends to evolve in response to demands from generals for an excuse to justify whatever they happen to be interested in spending money on, and the Soviet marshals and generals are no exception," Cockburn writes.

Relying on just enough history to make the reading interesting, he convincingly argues that the "threat" is not as serious as it's made out to be. What has been construed as the "threat" has come from egos who want more out of defense budgets. What better way than creating or exaggerating a "threat" to meet the demands for bigger and better weapons? Therefore, he writes, the perceived threat "bears little resemblance to the Soviet army as it really is."

Chapter Three, "The Unfortunates," begins the story of the Soviet military machine. It is about the Soviet draft system and should be an eye-opener to American young people. From the moment a young Soviet man is herded away under armed guard to a remote area (so he can't escape), he quickly learns about the corruption that permeates the Soviet military establishment—a corruption that continues throughout his military life, if he stays in (most do not).

Throughout the 16 chapters, Cockburn emphasizes the racial, alcohol, discipline, training and maintenance problems that are inherent to all branches of the Soviet forces. These problems, coupled with backward technology and bureaucratic inertia, virtually make the Soviet forces ineffective. Of special interest are the "Missiles and Bombers," "The Air Force" and "Air Defense" chapters.

Cockburn's credentials are impressive. A contributing editor of *Defense Week,* he received the 1982 George Foster Peabody Award for his television documentary, *The Red Army,* produced for the Public Broadcasting System. He has written on defense issues for American and European publications including *Parameters: The Journal of the Army Staff College.*

Reading this book may allow you to sleep a little more soundly at night. *—Claire B. Starnes*

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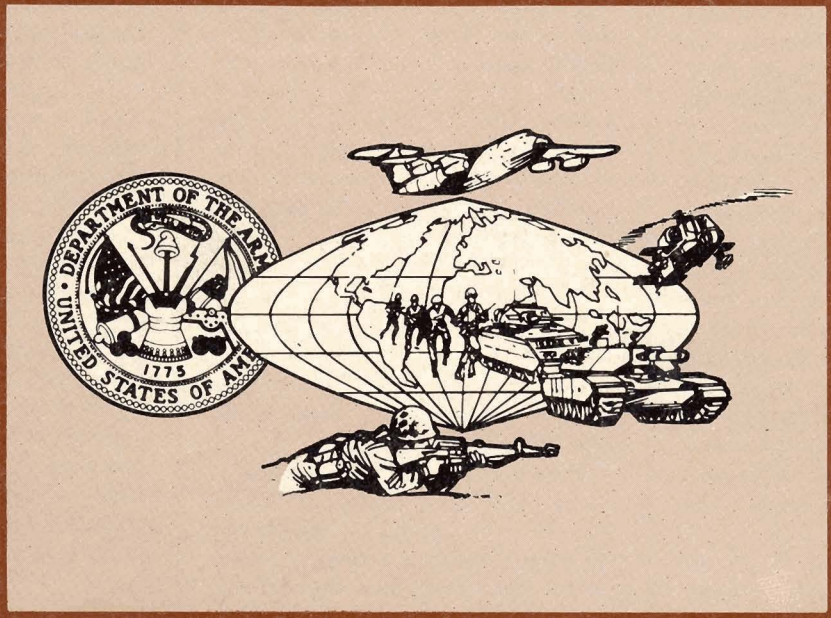
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