

# AIR DEFENSE ARTILLERY

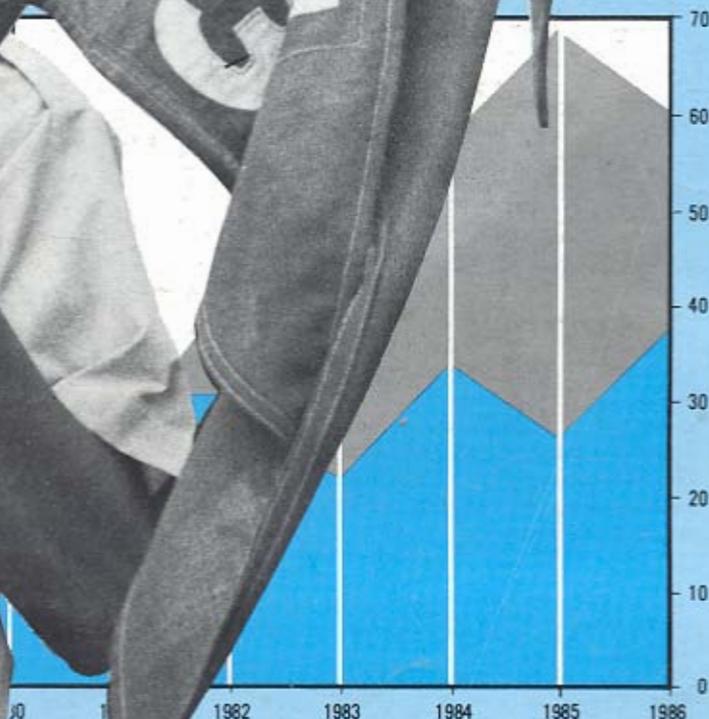


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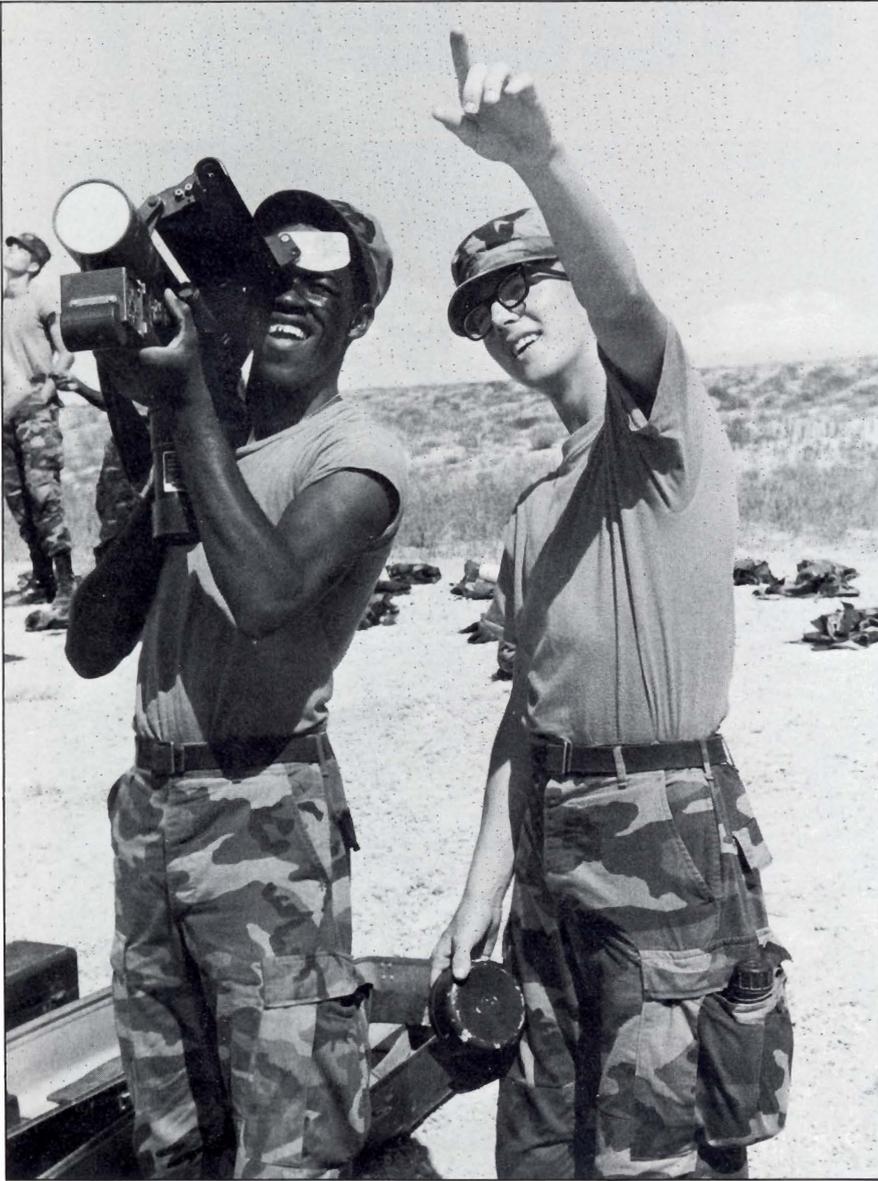
ADA's Raw Material

## QUALITY RECRUITS

... Page 24



# AIR DEFENSE ARTILLERY



## Quality Recruits . . . 24

The mental category quality of recruits in Air Defense Artillery has been steadily increasing during the last six years. Recruits are recognized as valuable resources, and the article "Quality Recruits: ADA's Raw Material" follows one air defense artilleryman through his initial-entry training phase. *Air Defense Artillery* wishes to thank D Battery, 3rd Battalion, One Station Unit Training, and SHORAD Division, 1st Instructor Battalion, both of the United States Army Training Center, Fort Bliss, Texas. Without their support this article would not have been possible.

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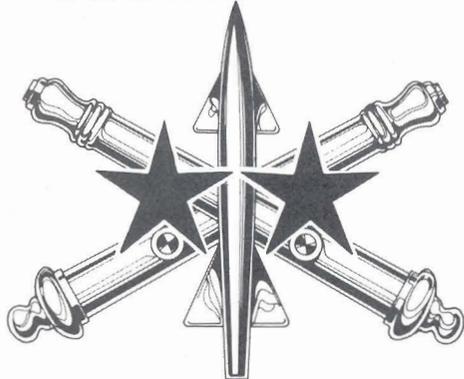
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# INTERCEPT



## POINT

**T**he British author Rudyard Kipling said “The backbone of the Army is the non-commissioned man.” He was right then, and his statement today remains true even to a greater degree. The key to victory remains initiative at the lowest levels of the battlefield. This is especially the case in Air Defense Artillery.

On Nov. 22, 1985, a historic event occurred at Fort Bliss, Texas. In a colorful ceremony, I took the post guidon from CSM Fred Stafford and passed it to CSM Ray Godfrin. This ritual involves much more than the passing of a guidon. More important was the passing of standards for the 18,368 non-commissioned officers and enlisted soldiers at Fort Bliss, and their 22,368 ADA brethren deployed throughout the world.

Being a standard bearer is not easy. A standard bearer leads from the front, not from the rear; sets mental, physical and ethical examples of leadership; and keeps his or her personal and professional life in good shape. The leadership of human beings makes a difference in our Army in peacetime as well as war. Napoleon said it well with his phrase that morale is to materiel as three is to one. Leadership is a big responsibility, especially if your sphere of influence is as described above.

Command Sergeant Major Stafford was up to the challenge. In all respects he was a superb non-commissioned officer. I've known him since my battery CO days in 1963. Some highlights from his selfless career include 35 years of dedicated service to our country, to our Army, to our soldiers and to their families. He served 14 years as a command sergeant major, almost seven of these years as the Fort Bliss command sergeant major.

But what was it that really made Fred Stafford a great non-commissioned



Maj. Gen. Donald R. Infante

officer and soldier? I've singled out the following five traits:

■ He was tactically and technically proficient. But, more importantly, he developed this trait in his subordinates. He instilled in them a desire for knowledge and a desire to win.

■ He truly cared — deeply and sincerely, not just for his soldiers, but for their families. He realized the stronger the families, the better Air Defense Artillery and Fort Bliss would be. His soldier-care philosophy also covered every aspect of a strong training and maintaining program.

■ He created a climate where subordinates took responsibility for their actions, whether good or bad, right or wrong. He allowed a climate of command to exist which gave subordinates the freedom to fail and grow.

■ He listened to subordinates and acted on what he heard. His listening typified the loyalty he had to both superiors and subordinates. After listening, he made things happen.

■ He was a teacher and mentor. He shared his experience, maturity and judgment.

But as great as Fred Stafford was, he was replaced by another superb soldier — Ray Godfrin, a close friend of mine for almost a decade; my brigade command sergeant major; a member of my family. His record speaks for itself. Ray Godfrin has rendered 33 years' service to our country, Army, soldiers and families. He has served 10 years as a command sergeant major at battalion, brigade and division level. Prior to reporting to Fort Bliss, he was the command sergeant major of the 32nd Army Air Defense Command where he and Maj. Gen. Victor J. Hugo Jr. made soldier-care a top priority. Ray Godfrin is unquestionably the right man for the job of Fort Bliss command sergeant major.

Upon asking myself what it is that makes Ray Godfrin so great, I arrived at the logical conclusion — the same traits which made Fred Stafford great.

■ He is tactically and technically proficient. He instills the spirit to achieve and win.

■ He truly cares. In 26 years' service, I've never met a command sergeant major who truly cares more about soldiers and their families.

■ He allows them the freedom to fail. He teaches subordinates to step forward and take credit for their actions, good or bad.

■ He is a teacher and a mentor, a master at what today we term “foot-locker counseling,” which is no more than talking to soldiers where they live and work.

Where does this leave us concerning these two superb soldiers? Just as Fred Stafford made history and made a difference on his watch, so will Ray Godfrin! If we could instill throughout the Non-commissioned Officer Corps these traits, our Army would be a great Army. Those of you who believe only generals make history don't understand soldiering. The fact is that it's non-commissioned officers and soldiers who make history. Command sergeants major like Stafford and Godfrin are the ones who get things done and make the Army great.

Command Sergeant Major Stafford was a superb standard bearer. I know you join me in wishing him all the best and Godspeed. However, I know that CSM Godfrin is also a great standard bearer and that he will make a difference. I am super pleased to be serving with him again as we write a new chapter together in our branch history.

It's another sign of our talent-blessed Army where no one is indispensable, where you can truly be all you can be. Which of you ADA non-commissioned officers is up to the challenge of replacing Ray Godfrin? Do you, as a professional non-commissioned officer, have these traits? If not, what are you doing about improving yourself? Our quality soldiers deserve the best. Leadership in peacetime and wartime makes a difference. Being a standard bearer is tough and demanding business.

But that's what we're all about as an Army — taking care of soldiers, and setting realistic and achievable standards. Command Sergeant Major Godfrin will show the way for the ADA Non-commissioned Officer Corps. Your challenge is to keep up.

# GODfrin

**T**he Bible says there is nothing new under the sun, and that applies to Air Defense Artillery. It's true the weapon systems have changed, and doctrine has changed, and Fort Bliss, Texas, has a new command sergeant major, but what's important — soldiers — hasn't changed and won't change.

Some soldiers call me "God," but not out of a sense of reverence or awe. I came by the nickname back during my first sergeant days. "You can take what I tell you as gospel," I'd say, and then I would cover up the last four letters of my name tag so that only the first three letters (G-O-D) showed.

It's a nickname I sometimes regret. Pronounced backward, as some soldiers, no doubt, are inclined to do from time to time, it takes on quite a different meaning. But I was trying to make a point. I wanted soldiers to know that they could trust me.

I inherited this page of *Air Defense Artillery* from my predecessor, Air Defense Artillery Center Command Sergeant Major Frederick T. Stafford Jr. As long as the column appears below my byline, you can take everything you read in it as gospel.

Candor is one of four military virtues commonly referred to as the four "Cs." The others are commitment, competence and courage. Candor, more simply, means honesty — the plain unadorned truth. I will tell you in all candor that I wasn't eager to exchange my old job as command sergeant major of the 32nd Army Air Defense Command in exchange for garrison duty at Fort Bliss. There's a sense of immediacy and urgency about duty in West Germany, where U.S. air defenders face Warsaw Pact forces across a few strands of barbed wire, that you don't find many places.

I can tell you with equal honesty that I was overjoyed to learn that I would be returning — for the sixth time — to the home of Air Defense Artillery. There's a sense of being at the center of things at Fort Bliss, a feeling you don't get many other places.

I'm an emotional soldier who believes emotion has a place in the Army. As I stood on the reviewing stand



Command Sergeant Major Raymond H. Godfrin, left, receives the U.S. Army Air Defense Artillery Center guidon from Fort Bliss commander, Maj. Gen. Donald R. Infante. Godfrin became ADA's top NCO upon the retirement of former Fort Bliss CSM Frederick Stafford Jr.

during the change of position colors that marked my assumption of duties and CSM Stafford's retirement and watched the battalions pass in review, my emotions were mixed.

There was pride. How could I feel anything else? I felt proud of being a part of the ADA family. Air Defense Artillery, after all, is filled with the most wonderful soldiers on earth, and being picked to fill two of the branch's top NCO slots in quick succession was an honor.

There was melancholy. Fred Stafford and I go back a long way together. We had served together in the "Triple A," had often fought like cats and dogs, and had shared a common love for the Army and for soldiers. He was the last ADA soldier to have fought in the Korean War, the last ADA soldier to have served in an all-black unit, and a trusted friend. His retirement marked the passing of an era, and I was sad to see him go.

There was also a sense of great optimism. Air defense artillery soldiers are dedicated, competent, hardworking and loaded with ingenuity. (They don't look nearly so good on paper. Air Defense Artillery's enlisted efficiency reports are among the worst in the Army, but that is something we are going to correct and a subject for a later column.) They can, and do, get the job done, even under the most impossible of circumstances.

It's fortunate we have such sensational soldiers for we face dramatic challenges. Command Sergeant Major Stafford's retirement seemed even more poignant because it came just as Air Defense Artillery had begun a difficult transition from older weapon systems to new weapon systems. The transition

cannot be made without dedication, determination and faith in the new systems.

Air defenders affected most by the transition challenge are reacting with commendable spirit. A Nike-Hercules soldier, who could have opted for non-ADA reclassification training but chose short-range air defense training instead, told a visting Army journalist recently that "We're still family. We're still proud to be part of ADA." They are proving what NCOs should never forget. Weapon systems may grow obsolete, but good soldiers are never obsolete.

Certainly, soldiers like CSM Stafford will never be obsolete. At his retirement ceremony, the 35-year veteran held aloft a glass of water. The water in the top half of the glass, he told soldiers assembled on the parade field, represents weapon systems procurement, force modernization, policy . . . all the things that generals have to worry about.

He poured half the glass of water out onto the parade field.

The bottom half, Stafford said, holding the glass outstretched, contains the things NCOs have to worry about. It holds everything we need to get the job done. It contains the only essential ingredients, and those are "soldiers, soldiers, soldiers."

The weapon systems will continue to change. They'll redesign the uniforms, rewrite the field manuals, revise the ARTEPs and restructure the battalions. But what's important — soldiers — won't change.

***And that's gospel.  
Think war! Give a damn!***

## 1/55 ADA Soldiers Learn to Survive

"I was dead tired. I felt like I'd been on a 30-mile road march," said Sp4 Ronnie Barnes. "It was all worth it. I learned to protect myself from radiation. We hung in there, and we were proud to receive compliments from the XO, first sergeant and commander."

Barnes, a light-wheeled vehicle driver, was just one soldier of Headquarters Battery, 1st Battalion, 55th Air Defense Artillery, Fort Polk, La., who participated in rigorous nuclear, biological and chemical training during a field exercise.

The first two days of the three-day exercise consisted of establishing defense positions, practicing small-arms air defense, digging foxholes and attending first-aid classes. The exhaustive training included two successful night operations.

Weary, following the intense two days of field training, soldiers then observed vehicle decontamination procedures and attended a briefing given by the 45th Chemical Company.

They were asked, "Should a nuclear war occur, how best could soldiers survive after coming in contact with chemical agents?"

Soldiers participated in seven situations with hands-on, mission-oriented protective posture four (MOPP 4) training. Working in pairs, the soldiers helped each other remove contaminated clothing. They learned and prac-

ticed safe procedures for accomplishing these tasks.

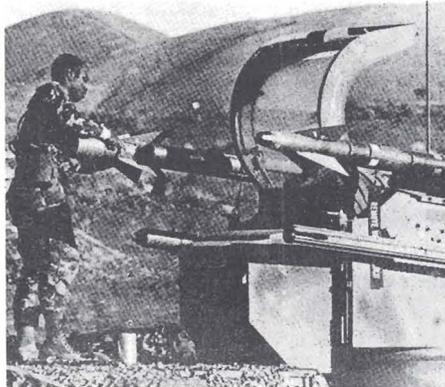
Helmets, personal gear and weapons were dipped in barrels of simulated cleaning solution, rinsed and then put in plastic bags.

"The training was set up well," said PFC Tim Coogan, a personnel administration clerk. "It's much more realistic to run through decontamination stations than to only have classroom lectures."

*by Bill Smith*

## 1/62 ADA Training Refined by Leaders' Suggestions

Exercise Opportune Journey was geared to sharpen weak skill areas for 1st Battalion, 62nd Air Defense Artillery, Schofield Barracks, Hawaii, before its Army Training and Evaluation Program (ARTEP).



Sp4 Shawn Cole, C Battery, 1/62 ADA, checks his Chaparral missile system before the live fire exercise. (Photo by Sp4 Robert P. Lindsay)

"We based the training on suggestions from senior NCOs and officers on the areas that needed refining," said 1st Lt. William Teeman, assistant S-3, Headquarters and Headquarters Battery, 1/62 ADA.

Opportune Journey began with a field training exercise in which the 1/62 ADA's mission was to provide low-altitude air defense coverage for the 25th Infantry Division by destroying hostile aircraft or nullifying their effectiveness.

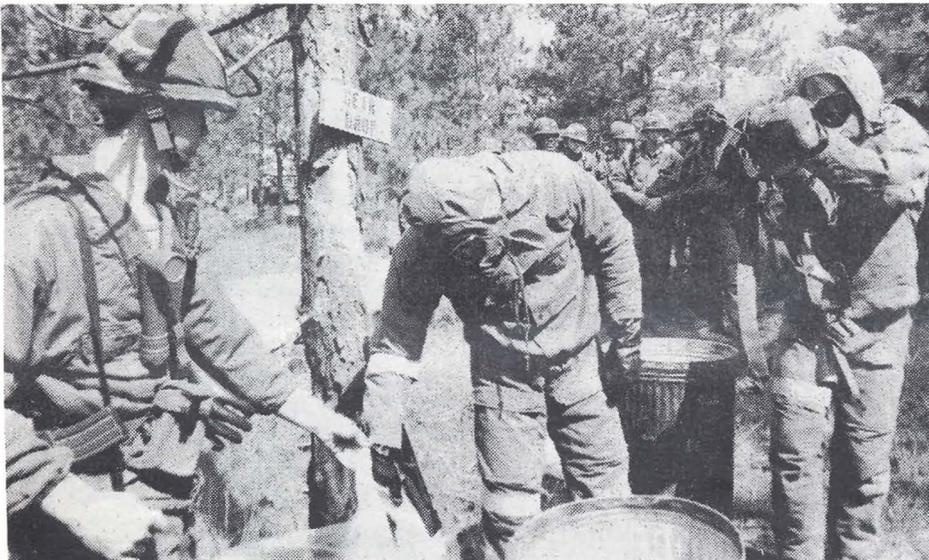
Teeman explained that the air defense artillery unit's missions were based on an operations order given by the division. The unit then wrote its own operations order accordingly, maneuvered, set up positions, established air defense coverage and changed missions while maintaining air defense coverage for the entire division.

"It starts when the division gives us the defense priorities," Teeman said. "Then we break it down to who is going to cover what." Following the field training exercise and battalion ARTEP, the unit conducted live fires at the Pohakuloa Training Area on the island of Hawaii.

Vulcan gunners fired at a red streamer pulled by a streaker, a remote-controlled mechanism. The streaker lent realism to the live fire by flying



It's apparent that PFC Donald Curry, B Battery, 1/62 ADA, made a hit during the live fire exercise. (Photo by Sp4 Robert P. Lindsay)



A decontamination supervisor directs 1/55 ADA soldiers to place gear in barrels to cleanse it of contaminants. (Photo by Bill Smith)

# Vapor Trails

ifferent courses, much like an aircraft. A device in the streaker provided hit or miss data to determine gunner proficiency.

The exercise ended with a two-day Chaparral and Redeye annual service practice. Twelve missiles were fired by the crews with the highest drill scores.

The exercise, according to Teeman, allowed the unit to work out minor problems in basic soldiering skills and tasks necessary to perform the air defense mission. "It gave us the opportunity to test our gunners' proficiency with Vulcans, Redeyes and Chaparrals, which helps us assess our training program implemented during the year. This was probably the most important outcome of the entire exercise," he said.

by Sp4 Robert P. Lindsay

## 1/3 Air Defenders Incarcerated in Grim Prisoner of War Camp

Air defense artillery soldiers faced some of the grim realities of being prisoners of war during recent training at Fort Campbell, Ky.

After a day of classroom instruction in survival, evasion, resistance and escape tactics, soldiers of C Battery, 1st Battalion, 3rd Air Defense Artillery, took part in an all-night operation. The operation ended the next morning in a march and incarceration in a prisoner of war camp.

Guards and camp cadre from the Prisoner of War Interrogation Section, Collection and Jamming Company, 311th Military Intelligence Battalion,



A hungry prisoner of war from C Battery, 1/3 ADA, refuses food offered by the enemy in exchange for information. (Photo by CWO 3 Garry L. Smith)

gave soldiers an idea of what life would be like in captivity.

The "prisoners" were subjected to hostile interrogations designed to force them to give more than name, rank, serial number and date of birth. The interrogators tried to get the prisoners to sign incriminating confessions for the enemy.

They also underwent a political indoctrination with revolutionary music playing in the background.

After a night with no sleep or food, an exhausting road march and severe harassment, the soldiers returned to real life and freedom, agreeing that life as a prisoner of war would be "pretty grim."

by CWO 3 Garry L. Smith

## A Special Feeling of Power 'Shakes' In 3/67 ADA Live Fire

"A feeling of power" is what Sgt. Tony Nicholson, a Vulcan crewman, gets out of aerial gunnery. "There's a special feeling with live rounds that you don't get with simulators. Live fire definitely shakes you — there's plenty of noise and power."

For the soldiers of 3rd Battalion, 67th Air Defense Artillery, 3rd Infantry Division, West Germany, Vulcan gunnery also means a mass migration to northern Germany where fresh challenges await.

"Nothing compares to this type of training," said Pvt. 2 Robert S. Friant, an A Battery Vulcan driver, about the



Sp4 Robert Cason, A Battery, 3/67 ADA, makes a final bore-sight alignment before moving up on the firing line. (Photo by Sp4 Leslie Messina)

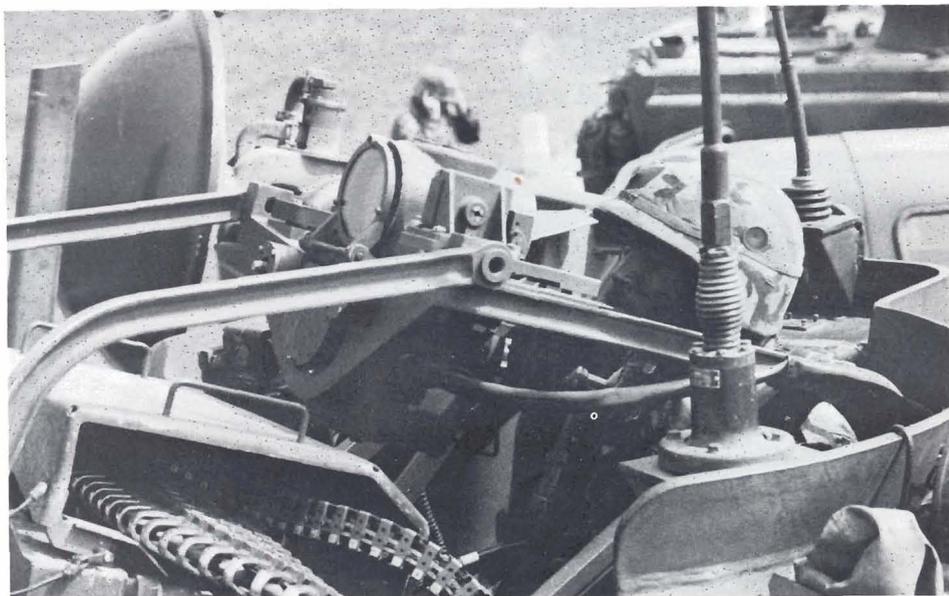
live-fire gunnery at Todendorf. "The whole environment is better, and the troops get into training more than they do in garrison or even Grafenwoehr."

After a week of ground gunnery training at nearby Putlos training area, 3/67 ADA Vulcan crews headed to Todendorf for the challenge of live-fire aerial gunnery qualification and performance evaluation.

During the two-week exercise, Vulcan crews also practiced crew drill, aircraft recognition and bore-sight alignment.

"Though live fire is the highlight of Todendorf, all of the training conducted there is important for the well-rounded ADA crewmember," said SSgt. Avery T. Gibbs, B Battery.

Gibbs, a squad leader, noted that his troops seemed intense about mission accomplishment and concentrated extra energy in hopes of being rated



Sp4 Forcie P. Murphy, B Battery, 3/67 ADA, uses his Vulcan to track the aerial target before firing. (Photo by Sp4 Leslie Messina)

# Vapor Trails

overall "best squad" during the exercise.

"It's a real troop morale booster," said Sp4 Tim L. Price, a B Battery senior gunner, of his two-week "vacation" in northern Germany. "We learn more about our systems and really get to do the job we train all year long to do."

Price said that because teamwork performance counts so much during the exercise, the pressure is on every Vulcan crew member to do well for his squad.

One artilleryman didn't seem to mind the competitive spirit of Todendorf. "We're the best squad, but other squads are right behind us," said Pvt. 2 David J. Walker, a B Battery Vulcan driver. Walker explained why his squad has an edge over the competition. "Our squad is like a family. My squad leader is like our dad, and my crew members are like brothers. Our compatibility and ability to communicate is the key to our higher standards."

Amid work and leisure at Todendorf, one objective stands above all others for most of 3/67 ADA troops, according to Walker. "We're here to blow the sleeve out of the sky!"

by Sp4 Leslie Messina

## 3/7 ADA Try Multinational Hawk Training Exercise

Take a German Hawk missileman and stand him alongside his American counterpart. Instantly, their differences are obvious. The uniforms aren't the same, nor is the language and military experience. The German, in fact, is in his country's air force, and the American is in the Army.

Then again, there are some striking similarities. For instance, both the German and the American missilemen learned their Hawk skills at Fort Bliss, Texas. It is the only U.S. military post in the continental United States with a German *kaserne* for trainees.

Also, the two air defenders read the same book for their guidance on operating the Hawk system. The book uses the same language whether printed in German or English — the language of Hawk.

That is how, in past years, the Ger-



1st Lt. Celia Florcruz adjusts an aiming circle at the 3/7 ADA operations center's tactical site during an ARTEP. (Photo by Sgt. M. Katherine Burke)



Sgt. Mike Garvin, A Battery, 3/7 ADA, answers questions from one of the German soldiers grading the ARTEP. (Photo by Sgt. M. Katherine Burke)

mans and Americans in the 1st Flarak Regiment and the 69th Air Defense Artillery Brigade have communicated in a series of multinational training exercises and evaluations.

The most recent joint venture was during the 3rd Battalion, 7th Air Defense Artillery's Army Training and Evaluation Program (ARTEP). A multinational team of evaluators graded the unit's performance during the four days. The 15 Germans on the team, headed by Lt. Col. George Weber, came from the regiment's operations staff.

"Most of us are from operations because that is the area we have most in common," said Weber. "It would be difficult for forces from another nation to evaluate in other areas because the supply system is different, the administration is different, the replacement is different. But, we have in common the operations portion."

"We have our special books that tell us what we have to do and how we have to do it. They're the same for all units under the Allied Tactical Air Force. All of us have specific instructions from higher headquarters. It makes no difference what nation; it is for all air defense members," he said.

Weber noted that this was not a first-time nor one-time event. It is an ongoing means of sharing information and keeping in touch with the way each other prepares for combat.

For the German evaluators, the ARTEP is an oddity. Their sole test of a unit's capabilities comes in the form of a tactical evaluation. "An ARTEP asks, 'How are my standards?' It is not a free evaluation. With this, we have a certain list of questions and only these can be asked. In our evaluation, for example, we have no build-up phase. Here you do," compared Sgt. Maj. Gert Jacobs, enlisted leader of the 1st Flarak Regiment.

According to Col. Chapin Horton, the 69th ADA Brigade commander, the ARTEP is used "to grade the unit and as the standard for what we do" on a regular basis. It not only checks the battalion's overall performance, but that of the individual soldier as well.

So how does the German evaluator fit into this scheme?

"If a plane should come during a certain phase, we see that they look at it, identify it and maybe engage the craft if it is of the enemy. We only evaluate

# Vapor Trails

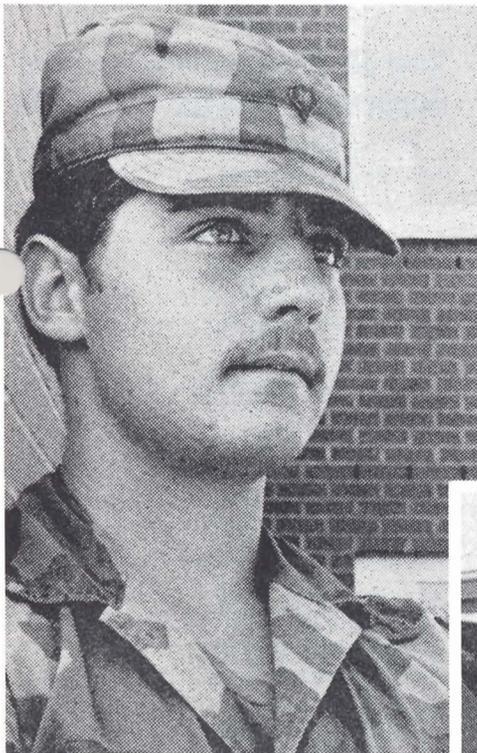
ose for the things in our area of responsibility," added Jacobs.

by Sgt. M. Katherine Burke

## 2/43 ADA Seeing Double

Battle dress uniform halfway on, Sp4 Pat Dial makes the unpleasant discovery that, despite the correct name tag, it just doesn't fit.

Having an identical twin in the same unit, A Battery, 2nd Battalion, 43rd Air Defense Artillery, 32nd Army Air Defense Command, West Germany, can create small problems like this. A 10-pound difference between Pat and Mike is one of few differences between them. But, it's enough to make every pick-up trip to the Quartermaster an adventure.



Sp4 Pat Dial

Sp4 Mike Dial

Another difference is that Pat parts his hair on the side, Mike in the middle. A slightly greater dissimilarity is that Pat, the elder by six minutes, is married. Other than these, everyone except the twins think they're carbon copies of each other.

"Even after knowing us for over a year, they still get us mixed up. To me, we don't look anything alike. The only time I think we did was when we were babies, and even I can't tell us apart in the pictures," Mike said.

The two Patriot operator and system mechanics share the same basic entry date, date of rank, unit and even the same barracks room, since Pat's wife is still in the United States.

In basic training, Mike said, they were always getting punished together. "The 'drill' would yell 'Dial' and, of course, we'd both report. From that point, he'd figure, 'Push ups would do them both good.'" So, regardless of whose offense, they'd both be pushing the floor.

The twins joined the Army because they were looking for a marketable skill and didn't want to go to college to get it. Both interested in electronics, they started training on the Nike Hercules system, but when offered the chance to learn Patriot, they grabbed it.

"Our platoon sergeants see that we work well together, so they've kind of made sure we stay together. Why break up a winning team?" Mike asked.

"It was nice to know in basic training, and any other tough time we've had in the service, that there was always someone there. Most guys don't have that," he said. "There is one other slight difference between us. We like to do most of the same things, but he's a lot more serious minded than I am. I'm sort of happy-go-lucky, but he's always



thinking about the future. Maybe those extra six minutes he has on me made him more mature. Either that, or marriage does it."

by Sgt. Laura Bower

## 'Up to Their Eyeballs in Mud:' 69th ADA Stalks Elusive Prey

Fighters zip overhead in low-altitude bombing runs. On the ground, a far-spread network of air defenders scrambles to weave a web of radar beams. This is the world of air defense — a high-tech battle waged well above an armor-laced combat zone. While some air defenders bypass much of the maneuver tactics of conventional ground warfare, they still are hunters, on the ground, stalking a sky-high prey.

"The presence of Air Force fighters is a tremendous plus for us," said Col. Chapin Horton, 69th Air Defense Artillery Brigade commander. "It gives us the opportunity to track and simulate engagements of live aircraft that are flying against us using the latest air tactics."



A 69th Brigade soldier uses an AP 11 to transmit needed messages during a recent brigade exercise. (Photo by Sgt. M. Katherine Burke)

Air defense artillery soldiers won praise from their brigade commander for spending the week-long exercise bogged down in the mud. Continual rains, with intermitten sunshine,

plagued the unit while in the field. "In some sites, these soldiers were up to their eyeballs in mud," said Command Sergeant Major Jimmy K. Williams.

"I don't recall any letdown that occurred in any unit. That is a general indication of the quality of soldiers we have in this brigade," Horton said.

The weather, in fact, became a major topic of conversation during the exercise. Soldiers, camped out in the clammy sludge, had a variety of comments on their state of affairs.

"The Army's good to go, but this mud . . . I just wish it would get hotter," said Corpus Christi, Texas, native PFC Juan Garza, C Battery, 3rd Battalion, 7th Air Defense Artillery.

"I'd rather be surfing," said Pvt. 2 David Lindy, who calls Rowland Heights, Calif., home. "This weather is ridiculous."

He added, "I met one of the German farmhands who works in these fields out here, and he told me he is in the German reserves. We were talking about the U.S. soldiers being here, and I asked him how he felt about it. He said he understood because the Army has to go where it has to go."

The brigade units concentrated on air defense and common task training. "Our weaknesses from our last field problem were strengthened. They were identified and worked on. The fact that we found them to be strengths this time is an indicator that our cyclic training management concept — of planning, training, evaluating and feedback — is working," the commander said.

When the tents were struck and the camouflage tucked away, vehicles cooled and missiles towed home, the command sergeant major made his assessment of the exercise. "The 69th Brigade soldiers have demonstrated, once again, that they can operate under any conditions: from the best to the worst. Our soldiers are flat good," Williams said.

*by Sgt. M. Katherine Burke*

## Wars Involve a Lot of People Reminds 2/57 ADA Chaplain

In Grenada, war snuffed out a young Army captain's life. It reached out many miles to haunt his suddenly widowed eight-months pregnant wife.

Captain Frank Burning was there and saw the pain and death, and



Capt. Frank Burning discusses his experiences as a chaplain in Grenada during a prayer breakfast. (Photo by Sgt. M. Katherine Burke)

shared in the joy of coming home. Now, as chaplain for 2nd Battalion, 57th Air Defense Artillery, 32nd Army Air Defense Command, he brings his first-person account to soldiers in West Germany.

"Wars involve a lot of people," Burning said to soldiers attending a 69th Air Defense Artillery Brigade's prayer breakfast.

"Obviously, there is the joyous side, when the husbands and wives come home from war — there is glory there — but there is also tragedy.

"One of the folks who was killed was a captain who commanded one of the infantry companies. I was back at Fort Bragg, N.C., in time for his funeral. Behind his casket, which was rolled forward to the division memorial chapel, was his wife who was eight months pregnant," Burning said.

"All of us were sad, but all of us were saddened more deeply at the sight of her coming in. It really brings to light, vividly, what it means to be in combat and how tragic it is when there's a loss of life."

Burning offered his insight into what he called the "expectation of wartime." The belief that "everybody's going to be comfortable" is a myth, he said.

"You may find yourself in a combat situation where, instead of having a GP medium, all you have is what you probably should be training in anyway — your pup tent.

"People have this expectation of wartime that everybody's going to be comfortable; everybody's going to have their stoves and have hot rations

rolling down through. That's simple, not the case."

Burning, among other tasks, did chaplain duties in Grenada, such as holding services and distributing 500 pocket-sized New Testament Bibles to soldiers.

"Nobody refused them, and just about everybody stuck them where I stuck mine — in the left pocket, just over their hearts. I'm not sure if they stopped any bullets, but they made people feel a lot better," he said.

"Wherever the chaplain is," he added, "you get together. You get the kind of spiritual stability and support that you have to have, then you go out and do the mission."

*by Sgt. M. Katherine Burke*

## New Air Defense Trigger Men Honored to Fire the Real Thing

It's over in seconds. First, a red target missile is launched. As it arcs across the clear desert sky, the Chaparral senior gunner sights it and lets an intercepting missile fly. Within the blink of an eye, the hunter is upon the hunted, and both disintegrate in a ball of fire.

At least that's what's supposed to happen.

Private 1 James S. Mol hoped he could make it happen. For him, the Chaparral firing was the climax of the seven weeks of 16P training. The B Battery soldier from 3rd Battalion, United States Army Training Center, Fort Bliss, Texas, was selected to be the Chaparral's trigger man for the live-fire demonstration by having the highest average score of the battery.

"This is what these guys have been learning all about," said SFC Ambrose J. Probst, a senior instructor of short-range air defense systems. "The one who gets to fire the Chap is the top man. I think that's great. It gives the soldiers something to 'shoot' for. They try to outdo each other as they learn to work as a team."

To fire the missile is an honor. Soldiers' families are given the opportunity to watch the exercise and, afterward, the gunners are decorated with pins showing they've fired the missile.

"I think it's rewarding for them to come out here and really see what the Chaparral can do. Most of the time all they see are simulations, mock-ups.

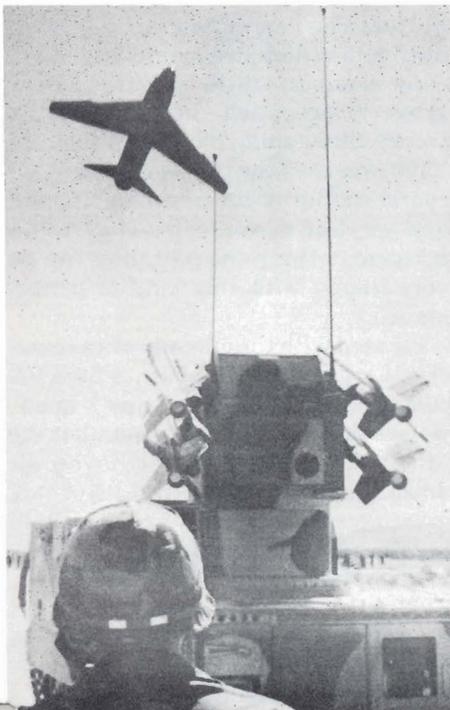
# Vapor Trails



A soldier from B Battery helps SSgt. Thomas Keating and SFC Ambrose J. Probst load the "real thing" onto a Chaparral missile launch rail. (Photo by Sp4 Greg Norton)

Once they see how it really works, it builds their confidence," said Capt. Edgardo Diaz, B Battery commander.

The firing provides a learning opportunity as well. Five B Battery soldiers helped prepare the warhead for firing and watched from nearby concrete



The target swoops up and away from four menacing Chaparral tracking missiles. Dud rockets provided one more level of realism to this final phase of training. (Photo by Sp4 Greg Norton)

bunkers as the missile streaked toward its target. All were among the soldiers with the highest averages in B Battery, and all of them had spent their morning preparing for this moment.

That preparation included tracking an elusive target from the cockpit of the Chaparral. Time after time an A-7 Corsair jet screamed toward the gunners, swooping up at the last instant as the soldiers pointed their missiles. All the 16Ps in B Battery tried their hand, learning every step of the way, knowing they had a long way to go.

For B Battery, the countdown began. Graduation was only two days away for these soldiers. Private 2 Michael R. Milligan, one of the five graduates who helped prepare the Chaparral for firing, summed it up seconds before the launch. "We have a lot to learn yet," he said.

Then the missile flew, leaving only smoke where, for an instant, there was a target. The Chaparral missile made a direct hit.

by Sp4 Greg Norton

## 4/61 ADA Soldier's Success Credited to Squad Leader

"Three, two, one, BAT launch!" And with that, one of the orange ballistic aerial targets (BAT) streaked through the air. Chaparral gunner PFC Marvin Morrow tracked the missile for

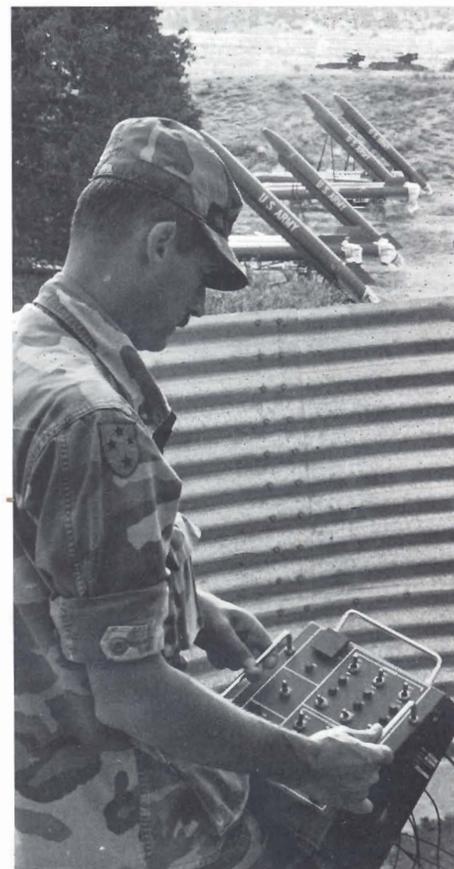
what seemed to be only a few seconds. Morrow pulled the trigger, and with a bright flash and plume of white smoke, one of his missiles chased the BAT. Morrow's missile reached the target and blew it from the sky.

Cheers and shouts rose from the bleachers as the BAT fell to the ground in flames. It was a proud moment for C and D batteries, 4th Battalion, 61st Air Defense Artillery, Fort Carson, Colo. It was a proud moment for Morrow's Chaparral crew and a proud time for Morrow. It was a moment that few 4/61 ADA Chaparral crews get.

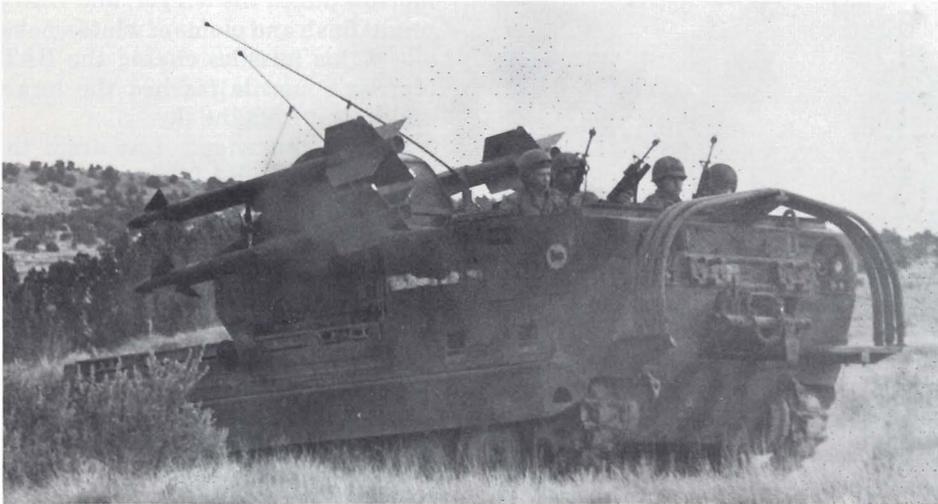
Each battery receives only six live missiles to fire each year. Each year a competition determines which crew will win the right to fire. The competition includes upload, emplacement, target engagement and march order.

In response to winning the right to live fire, Morrow said, "It feels really good. It gives you the chance to know what it's like to fire in combat. It gives you confidence."

Morrow said much of his success is due to the supervision of his squad leader. "You can't really do anything



SFC Norman Ellis prepares to launch a BAT. Safety is top priority around the electrically sensitive targets. (Photo by Sgt. John Millar)



A 4/61 ADA Chaparral crew moves to a firing position. (Photo by Sgt. John Millar)

without a good squad leader. Straight out of AIT, you don't have that much experience. But if your squad leader knows his job, he'll make sure you know yours."

Morrow's squad leader, SSgt. Robert Carson, said, "I had no doubt at all" that Morrow could successfully shoot down his target. He added, "It takes a lot of effort on the part of the whole squad. And it takes a lot of training."

According to Capt. Joe Harkey, D Battery commander, "We probably go to the field more than anyone. We're one battalion supporting three brigades." And until recently, every time the Chaparrals went downrange, they could never fire, only pretend.

"All too often, we'll be downrange, a chopper flies over, we track it, pretend to shoot at it, but it never knows, and continues its mission," Harkey said.

But with the recent addition of Multiple Integrated Laser Engagement System/Air to Ground Engagement System (MILES/AGES) in the division's aviation and air defense artillery units, realistic training is possible. "With MILES, we can shoot at him, he knows he's been hit and can't continue his mission."

According to Morrow, however, nothing beats the real thing.

by Sgt. John Millar

## Hawk Soldiers Participate In 'Uncanny' Field Exercise

Air defender Sp4 David Stone has seen his share of Hawk reloading exercises begin and end. However, Stone and his fellow 2nd Battalion, 62nd Air Defense Artillery, 32nd Army Air Defense Command, West Germany, air

defenders have never seen one quit like their latest.

In the past, the missiles were delivered directly to the individual batteries. But during a recent exercise all four batteries' allotments of missiles were delivered to a single field location.

Launcher crews from all four batteries unloaded the missiles from the trucks, assembled them and delivered them to their respective batteries.

"Under this concept, the battalion works as one," said SFC Hugh Garretson, NCOIC of the missile resupply operation. "The batteries' missile crews work together to accomplish the mission. We send the missiles to the battery that needs them the most.

"During the exercise, the first six missiles decanned and assembled have been designated for Charlie Battery," he said. "If we get word that Charlie was hit by enemy fire and is non-operational, we could then direct those missiles to be sent to Alpha. It is a much better concept than the old one, certainly more feasible in a wartime situation.

"This is really quite a mission," Garretson said. "Our batteries are all located within a 300-mile diameter. The soldiers worked around the clock to complete the exercise. Alpha and Charlie batteries' crews worked day shift until relieved by Bravo and Delta."

As members of the A Battery crew gingerly unloaded the cans off the trucks, Stone said, "This is the fastest I have ever seen the trucks unloaded. Of course safety is an important factor, and we didn't even come close to an accident. I think the battalion can be very happy with this kind of performance."

Pleased with the outcome of the exercise, Lt. Col. A. J. Madora, 2/62 ADA commander, said, "As far as I know, we are the first battalion to undertake this kind of concept. We will have to sit down and evaluate the results of this exercise, and it just may be the way we handle all future transfers."

Also pleased, Maj. Evan Spiceland, 2/62 ADA executive officer, said, "It was a tremendous opportunity for us to take part in this exercise. We will now know exactly how much time it takes the missiles to arrive from the 32d Support Command, get unloaded, decanned, assembled and transferred to the batteries."

by Sgt. Jim Hekel



A 4/61 ADA gunner fires a Chaparral missile after winning the right through competition. (Photo by Sgt. John Millar)



# ADA Laydown

An ADA concept reassessment nearing completion at Fort Bliss will change the way Air Defense Artillery conducts business

The following article previews some of the major changes air defense artillery soldiers can expect from an Air Defense Artillery "laydown" nearing completion at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas. *Air Defense Artillery* plans to devote a major portion of its Spring 1986 edition to a detailed analysis of the laydown proposals once they have been presented to the Department of the Army.

by Blair Case

Since May 1985, a group of task forces engaged in an "ADA Laydown" at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has been at work on a definitive reassessment of air defense artillery force configurations, strategies and tactics. The ADA Laydown Group is scheduled to present a revised air defense artillery concept to the vice chief of staff of the Army for approval in mid-January of this year. The proposal will eventually wind up on Secretary of Defense Caspar W. Weinberger's desk for approval, and the outcome will govern the way Air Defense Artillery fights for decades to come.

The Army vice chief of staff ordered the laydown because he thought Air Defense Artillery had never adequately articulated its role on the modern battlefield to senior leaders of the Army in a comprehensive manner. He charged the branch with a formidable task: to come forth with a complete ADA "laydown" to demonstrate how Air Defense Artillery integrates its components at all levels within the branch and the rest of the Army and Air Force.

The ADA Laydown Group had already moved its operations into the basement of the U.S. Army Air Defense Artillery School Headquarters in August 1985 when word arrived that Weinberger had ordered the termination of the Sergeant York Gun, the weapon system that was to have be-

come the mainstay of divisional air defense artillery.

The ADA Laydown Group, fortunately, had top priority and plenty of muscle. At times, as many as 50 officers, NCOs and enlisted soldiers were at work on the project. The group included the heads of some of the Air Defense Artillery School's most powerful and influential organizations. Col. John H. Little, director of the school's Directorate of Combat Developments (DCD), had temporarily turned the directorate's reins over to his deputy director in order to take charge of the group. The group's seven task force leaders included three TRADOC system managers, the boss of the school's Tactics Department and the chief of DCD's Concepts and Studies Division. The group had daily input and guidance from Maj. Gen. Donald R. Infante who, as the Air Defense Artillery School commandant, calls the shots for all of Air Defense Artillery.

Still, the Sergeant York termination presented the ADA Laydown Group with a significant new challenge.

"It was as if someone had pulled the rug out from under us," Little recalled. "There were three pillars, the high-to-medium altitude air defense systems, the Sergeant York heavy division ADA battalion, and short-range air defense command and control, propping up Air Defense Artillery. Suddenly, one of the pillars had been eliminated.

"The Sergeant York termination left us with a void to fill in the heavy division ADA battalion, and it drastically affected other force configurations. No matter how you look at it, the termination of the Sergeant York program has cost Air Defense Artillery two years," Little said. "We've lost two years in the full development of our corps ADA brigades, which will probably be less robust at first than as originally planned. And it's slowed the pace of the modernization of our air defense National Guard units which were to receive weapon systems the fielding of Sergeant York would have freed from the Active Army.

"Filling the void left by Sergeant York, however, was just a part of the problem," Little said. "The ADA laydown will provide an answer to ADA's 'burning question': What system is to replace the Sergeant York Gun? More importantly, it will produce a new Air Defense Artillery concept that will govern ADA force configuration, weapon acquisition, strategies and tactics for decades to come.

"The ADA laydown parallels a separate study being conducted by combined arms planners at Fort Leavenworth, Kansas." Little explained. "The Forward Area Air Defense Working Group at Fort Leavenworth is looking at air defense from a combined arms approach. They are devising strategies for 'offensive'

air defense designed to destroy enemy aircraft on the ground, obliterate their forward refueling and armament points, and disrupt their command and control once they're airborne. And they are studying ways to improve passive air defense, the measures our forces can take to protect themselves from air attacks in the absence of air defense artillery."

The coordination between the Fort Bliss task force and its combined arms counterpart in Kansas is intense. The two studies represent the Army's most determined attempt to grapple with the problems the air threat poses to its new Air-Land Battle Doctrine.

"The combined arms initiative is an admission on the part of the Army that there's not enough air defense to go around. We are saying that Air Defense Artillery needs help; that it will be impossible for us to inflict a high enough rate of attrition on enemy aircraft with air defense weaponry alone. It's also a recognition that the Soviet attack helicopter is a threat the Army has to deal with, a problem that we can't turn over to the Air Force which, in past wars, waged the offensive portion of the air battle by attacking enemy air bases," Little said.

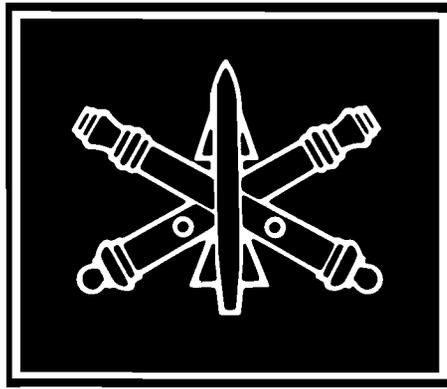
"Here at Fort Bliss, we're working from a branch perspective. We are concentrating on 'defensive' air defense, the defense of our forces from attacking aircraft," Little continued. "The results of the two studies, here and at Fort Leavenworth, are going to have a profound affect on the way Air Defense Artillery conducts business."

### **Sergeant York Replacement**

The ADA Laydown Group leader was willing to predict some "probable" results prior to the DoD screening. As many as five candidates to replace Sergeant York are expected to emerge from the laydown. The candidate systems will probably compete in a "shootoff" late this year or early 1987. The winner may, or may not, be a gun system. It could as easily be a missile or combination gun-missile system or even a missile-missile system — that's a missile system with a complementary missile system.

"Logic might seem to dictate that you would replace a gun system with a gun system," Little explained, "but that's not necessarily the case. The requirements for a replacement system have changed because the threat Sergeant York was designed to counter has changed.

"Technological improvements in the



near term could give Soviet attack helicopters a stable hover capability they didn't have before. They would no longer have to fire on the run and guide the missiles in toward the target. And they would no longer have to expose their flanks as they swerve away from the target after releasing their ATGMs. A stable hover capability could give attack helicopters a greater standoff range and drastically reduce their exposure to air defense fires. This is what killed Sergeant York."

The Sergeant York replacement system will have to conform to the heavy division ADA battalion's 613-man table of organization and equipment, a TOE designed for Sergeant York. The manpower restriction means that a replacement system will have to have a small crew — probably no more than three crew members — a restraint that might give a "line-of-sight" system an edge in the competitive shootoff.

No matter what weapon system ultimately replaces Sergeant York, it will probably take at least two years, probably more, before the heavy division ADA battalion is rearmed. The replacement system, moreover, is likely to be only a temporary solution. The long-term solution may require the conceptualization, development, testing and fielding of an entirely new system.

### **Strategies and Tactics**

Perhaps the most profound change emerging from the ADA laydown, though it involves no new hardware, is a basic change in low- to medium-altitude air defense strategies.

"We expect a shift away from cluster defense — the practice of massing air defense systems around vital assets — to a more uniform distribution of air defense artillery throughout the protected force," Little said. "There will be no major changes for Patriot, but we hope to improve the mobility and survivability of Hawk so we can push

some of them forward from the corps area to within five to 10 kilometers of the forward edge of the battlefield.

"We are also looking at ways to increase the survivability of all our air defense systems. This includes improving passive air defense measures," he added.

### **Impact on Personnel**

The ADA laydown will send shock waves rippling throughout Air Defense Artillery. It will determine how both the heavy division and light division ADA battalions are armed. The revised air defense artillery concept will trigger the rewriting of ADA doctrine and tactics which, in turn, will leave Air Defense Artillery with a library of field manuals — many of them already outdated by the termination of Sergeant York — that will have to be rewritten. The results of the ADA laydown, however, seem likely to affect force configurations, strategies and tactics much more than it will affect the careers of individual soldiers, many of whom already faced sharp career readjustments.

Chaparral/Vulcan units will continue their transition to the corps brigades as their force structures are used to field the "new systems" organizations. The Vulcan systems and some of the Chaparral systems will go to the National Guard. Nike Hercules soldiers are being retrained for new assignments. Redeye will continue its gradual departure from the Active Army inventory as it is replaced by improved Stinger.

The U.S. Army Military Personnel Center lifted the stabilization of Sergeant York Follow-on Evaluation Battery personnel last November and set a goal to have soldiers with Sergeant York MOSs reclassified, in reclassification training or scheduled for reclassification training by June 1. "MILPERCEN recognizes the importance of taking care of these soldiers and the contribution they have made to the ADA community and the Army," a message relaying the destabilization order said. Some soldiers, of course, will be offered the opportunity to train on whatever weapon system is chosen to replace Sergeant York.

Air Defense Artillery, during the challenging period of change and transition, will rely on the spirit of dedication and adaptability that soldiers who wear the crossed cannons and missile insignia have demonstrated since the branch was created.



# Are ADA Guns Dead?

by Brig. Gen. W.H. Riley Jr.  
with  
Maj. C.E. Kirkpatrick

**I**n the wake of the termination of the Sergeant York Gun program, Army decision makers are re-examining the role of air defense artillery guns on the battlefield and asking pointed questions about the need for ADA guns in the light of threat helicopter stand-off engagement capabilities. Some of the old tried-and-true ADA concepts are being challenged: "Do missile dead zones exist on the battlefield?" "Is the gun-missile mix still necessary, given the threat and need for long-range engagements?" and "Isn't it possible that the Abrams tank, Bradley Fighting Vehicle and helicopter air-to-air weapons could fill

the ADA void created by the Sergeant York termination, leaving ADA to convert to the role of missileers?" *Army Times*, in its issue of Sept. 9, 1985, quoted an officer from the DIVAD Program Management Office who highlighted these questions when he said: "We have no alternative to fill the void directly. I do believe that it will be difficult to push a gun again, however. It's likely that we'll have another rocket."

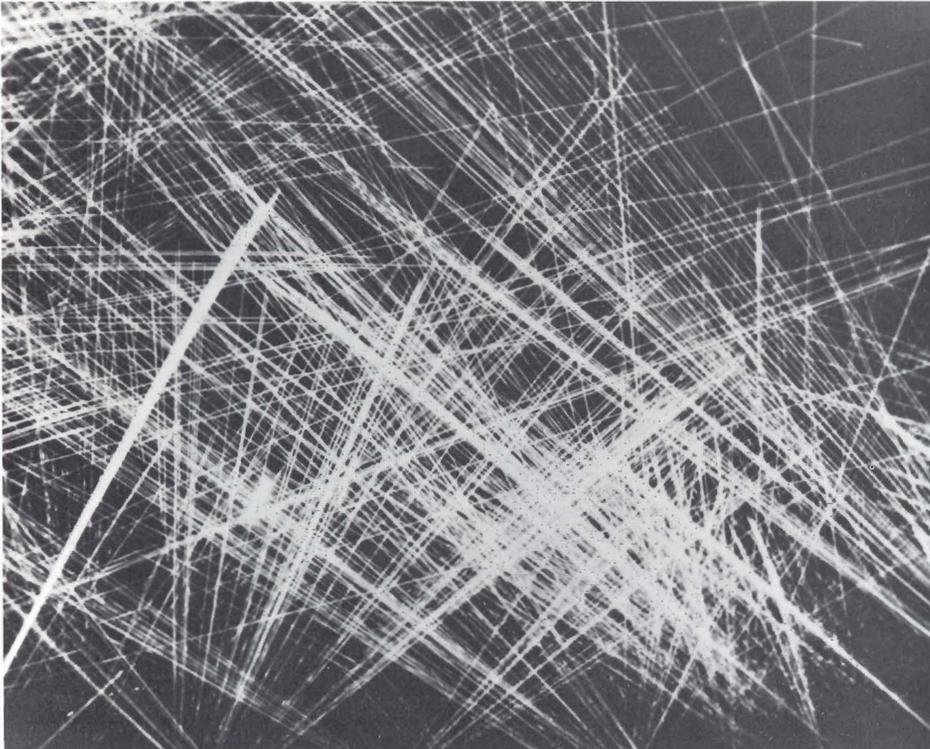
The business of Air Defense Artillery is to protect the forces and allow the ground commander to execute his maneuver scheme, since the key to the air-land battle is the capability of our forces to maneuver. The airspace of a theater of operations is as important to ground operations as the terrain itself. The demise of the Sergeant York, designed to meet the low-altitude threat, leaves the Army casting about for a solution. While many issues are being worked on by the ADA Laydown Group at Fort Bliss, Texas, and the Forward Area Air Defense Working Group, Fort Leavenworth, Kan., it is apparent that forward-area air defense has at the moment regressed to the concept development stage. We must be sure that our analysis of threat characteristics is accurate, and that our development of operational concepts is solid in order to sort out the multitude of weapons alternatives and the flurry of con-

tractor proposals that are certain to be thrown at the Army.

The quick answer to the threat stand-off engagement capability might seem to be that missile systems, with their longer-range capabilities, can satisfy the forward-area air defense requirements. Indeed, the cry for increasing the number of Stingers in different configurations with maneuver task forces has arisen, and many people believe that podded and pedestal-mounted MANPAD systems are the answer. For a variety of reasons, however, including the inherent limitations of various missile systems, no single weapon can suffice. The real solution to the forward-area air defense problem is a more complex one that simultaneously accommodates the Air Defense Artillery doctrinal principle of weapons mix and the Air-Land Battle Doctrine tenet of synchronization of fires. Missiles are necessary for forward-area air defense; the inherent air defense capability of the infantry and armored units are necessary for forward-area air defense; and air defense guns are also necessary for air defense.

Missiles will remain the mainstay of air defense. They can engage at ranges far in excess of any other type of system; they can engage a maneuvering target at long ranges; they have the flexibility to meet the growth of the threat capability; and they have a high probability of kill. In fact, the cornerstone of forward-area air defense is the missile. But that cornerstone must be buttressed by two other major air defense capabilities, the self-air defense capabilities of the combined arms team and a credible ADA gun to supplement the missile system.

The ability of the combined arms team to defend itself from air attack remains crucial. Infantry small arms for air defense coupled with the use of the .50-caliber machine guns organic to infantry units are significant last ditch defenses. Similarly, the 25mm gun on the Bradley Fighting Vehicle offers an air defense capability, albeit one with a fairly low probability of kill. The M-1 tank can also engage helicopters with its main gun, but since the 120mm tank carries only 40 rounds, how many rounds can they afford to use in an ADA role? Finally, the air-to-air capabilities currently being studied for



Massed ADA fire over the bridge at Remagen demonstrates the chilling psychological effect of anti-aircraft guns.

Army aviation units offer another way to combat attack helicopters. But with the lethal numbers of hostile ADA units covering the forward line of troops, how long can we expose such an expensive and low-density weapons platform as the Apache to high attrition? It's also worth noting that none of these alternatives offer the vitally important capability of early engagement of hostile aircraft.

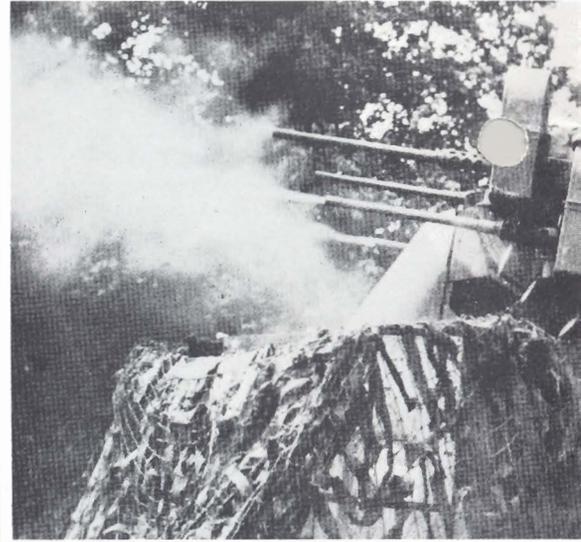
The crux of the matter is that the ground-maneuver forces simply cannot go it alone in the business of air defense. They must fight the enemy's maneuver forces. To focus on air defense would detract from their most important mission, and the training effort required would dilute the intensity of training critical for those highly skilled soldiers to fight their own battle. How much time, for example, can a tank crewman afford to devote to such matters as visual aircraft recognition, airspace management, and air defense command and control? In a one-on-one engagement, the M-1 tank can doubtless acquire and kill a helicopter. But in a pitched battle, involving enemy tanks, infantry and anti-tank systems, the tank commander and gunner have many more pressing problems. When operating heads-in, M-1 and M-2 crewmen have such a restricted field of view that there is real doubt they could ever see the helicopter that's getting ready to shoot at them. Further, if we

hang all the bells and whistles on tanks and Bradleys necessary to optimize them for ADA, then we must worry about three parameters: dollars, pounds and cubic inches. That's to say, will we make those weapons cost too much, weigh them down, clutter them up so they can't carry anything, and

*The air defense gun is a critical member of the combined arms team. I advocate keeping it in a proper gun-missile mix in the divisional ADA battalion.*

ultimately detract from their main purpose of closing with and engaging enemy ground forces? For these and other reasons, the anti-aircraft gun remains important.

That brings me to the heart of the argument. And to set the record straight, let me give you my bias up front. I believe that anti-aircraft guns still belong in the division. This continued need for guns is not to the exclusion of missile systems or the air defense capabilities of maneuver units, but it is a reaffirmation of the unique role that guns play in suppressing the enemy's fixed- and rotary-wing capabilities. The air defense gun is a critical member of the combined arms team. I advocate keeping it in a proper gun-missile mix in the divisional ADA battalion because it is still absolutely es-



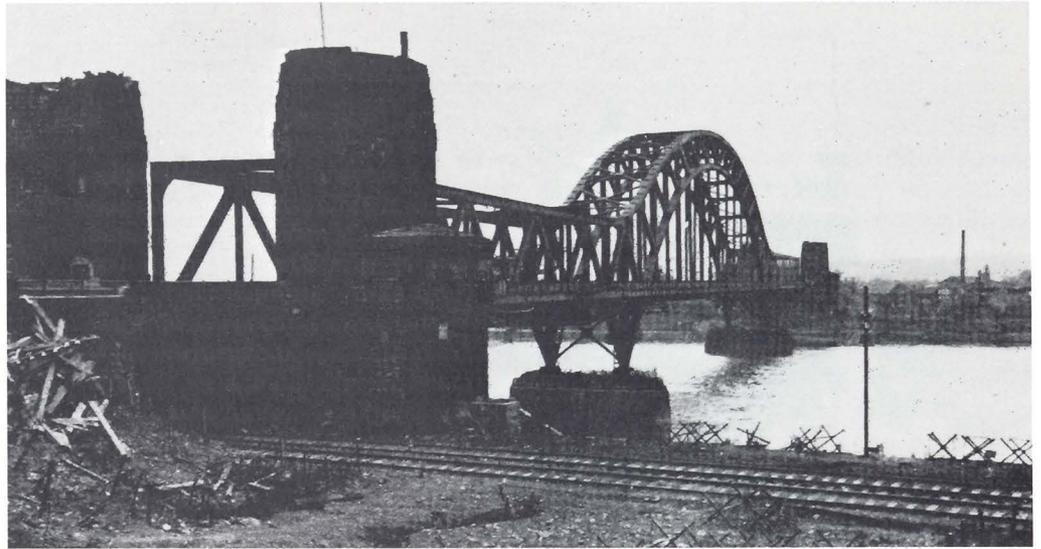
Quad .50-caliber machine gun, WWII

sential, especially on an increasingly high-tech battlefield.

Ask any pilot. He'll tell you in plain, common-sense language that "fighter jocks are afraid of guns." Pilots are aware of the important contribution guns make to the battle. Even when guns miss, pilots must jink and maintain high air speed, decreasing their accuracy in weapons delivery. Furthermore, being under gun fire "often increases a pilot's stress," as one pilot recently wrote, diminishing his performance. That is as true for helicopter pilots as it is for fixed-wing pilots. The bottom line is that guns give us *virtual attrition* of the enemy aircraft, another way of describing suppression of aircraft. Together with surface-to-air missiles, guns offer the comprehensive protection maneuver units need.

Advocates of a pure-gun solution, like advocates of a pure-missile solution, miss the point. The doctrinal requirement for weapons mix remains as valid today as it was in 1918. In that year, Army gun battery commanders discovered that strafing aircraft could attack their positions in such a way that the gunners could not respond. The guns could not be traversed and fired fast enough to cope with the low altitude, relatively high speed and rapid crossing rate of the strafers. They recognized that ADA systems had dead zones that must be covered by overlapping fires and by a complementary mix of weapons. Properly done, such an anti-aircraft defense possesses great elasticity and flexibility and is deadly to attackers.

The Egyptian defense of the Nile Delta airfields in 1973 is a near-perfect example of an air defense umbrella.



The bridge at Remagen

The Egyptian air force emplaced SA-2, SA-3, SA-6 and SA-7 missile systems, together with ZSU-23-4 guns. Their solution to a difficult air defense problem was based upon weapons mix, mobility of systems and massing of fires. Those defenses were eventually breached only by ground forces. While the missile units were as effective as one might expect, the real surprise from the 1973 war was that guns were still extraordinarily effective and played a large role in blunting Israeli A-4 attacks on airfields. In fact, guns accounted for nearly one-third of all Israeli aircraft losses during the war. This is a timely reminder that flak units represent a lot of combat power.

The point, then, is that guns are complementary to missiles. Neither can provide coverage throughout the entire envelope. Guns, in particular, cover the low altitude and missile dead zones. Proper weapons mix ensures that attacking aircraft will be met at every altitude by effective fires. We must remember, however, that mix refers not only to weapons, but also to guidance systems, acquisition systems and communications nets. We must be extremely wary of basing all of our forward-area air defense on one guidance system, for that vastly simplifies the enemy's task in coming up with effective countermeasures. A variety of types of guidance, as with acquisition systems, complicates the job for enemy aircraft trying to use countermeasures against forward-area systems.

Even in a high-tech world, the simple gun can be effective on the battlefield. Available statistics show that anti-aircraft guns are more effective than

we commonly suppose. To the percentages of losses attributable to guns in the 1973 war, we may add:

- Aircraft losses in South Vietnam due chiefly to gun fire included 410 fixed-wing and 2,100 rotary-wing aircraft.

*The thing that we often forget, however, is that we don't have to kill the helicopter to be effective against it.*

- In the Lam Son 719 Operation in Vietnam, slightly more than 100 Army helicopters were lost in combat with roughly the same number of Army pilots and crewmen killed or missing in action and several hundred others wounded. The Air Force lost seven fighter-bombers, and four pilots were killed in action. To put these helicopter combat losses in better perspective, it should be remembered that our assault (troop carrying) and attack helicopters were operating against an extremely dense and effective low-altitude air defense gun system that had the advantage of being able to concentrate on the natural flight routes imposed by the mountainous terrain, especially in marginal weather.

- The Air Force lost some 544 aircraft of all types to ground gun fire in the Korean War — almost five times as many as were lost in air-to-air combat.

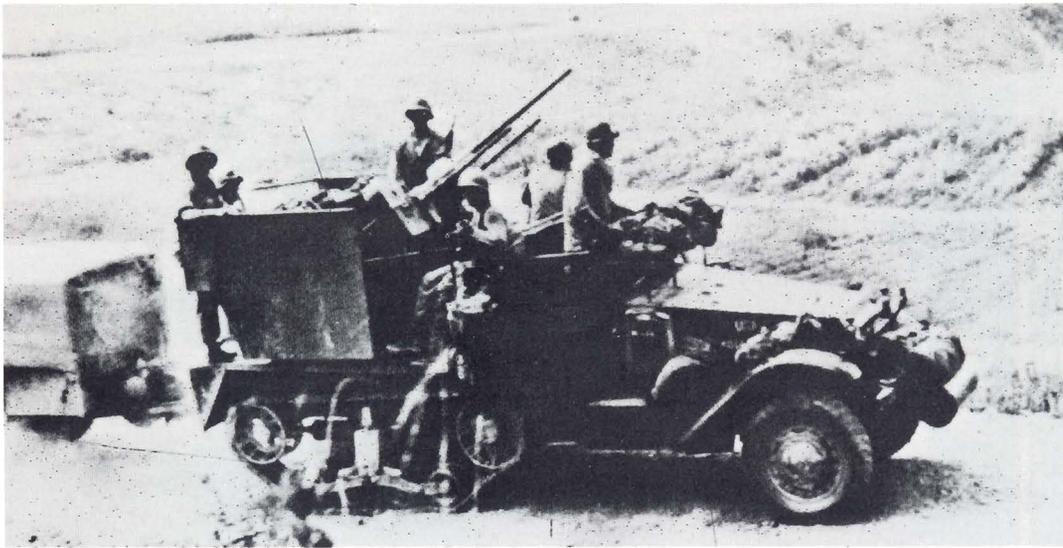
- The 8th Air Force lost 5,380 aircraft to anti-aircraft artillery (AAA) fire in the European Theater of Operations between 1942 and 1945, as against 4,274 aircraft lost to fighters.

The reasons behind such a success rate are clear. Fixed-wing aircraft must

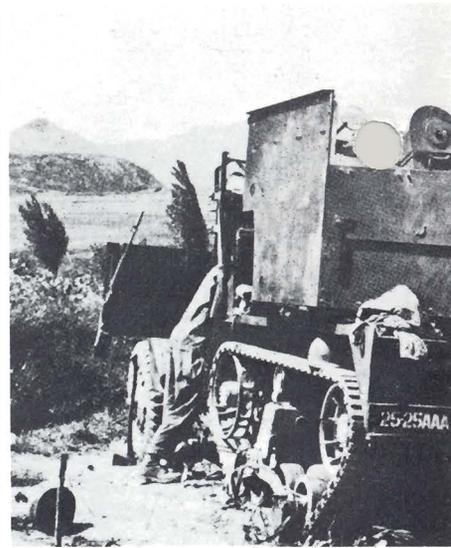
to *kill* the helicopter to be effective against it.

Armor, Infantry and Field Artillery must kill the enemy to be effective; thus, they all belong to the "stiletto through the heart" school of gunnery. Only a kill matters to them; a near miss is just another way of describing failure. But for the air defense gunner, a near miss may indeed be as good as a kill. Suppression is the key, rather than catastrophic kills. If the aircraft fails to shoot the tank because of ADA fire, then the mission is accomplished despite the fact that the aircraft continues to fly. Hence, an optically directed gun intended to cover missile dead zones can be as effective in suppression of aircraft at up to three to four kilometers with a 50 percent kill probability as can a radar-directed gun with a 90 percent kill probability. It is also considerably cheaper.

One of the best cases for the optically directed automatic weapon (AW) gun is the anti-aircraft defense of the Remagen bridgehead in March 1945. Elements of the 482nd AAA AW Battalion were pushed across the tottering Ludendorff Railroad Bridge along with forward units of the 9th Armored Division. A rapid AAA build-up followed to defend the bridge against German air attack. At that time Remagen was the sole Rhine crossing in Allied hands. Four hundred and forty-two German aircraft attacked the bridge. Of those, 142 were destroyed by AAA defenses, with another 59 probables. Attacks included what may well have been the first U.S. Army AAA action against jet aircraft — mostly Arado bombers, but at least one Me-262 sortie. The AW fire was successful in denying attacking



Halftrack-mounted Quad .50-caliber machine gun, Korea



Halftrack-mounted Quad .50-caliber machine gun, Korea

fly low and reduce speed to deliver conventional ordnance with any degree of precision. In the case of point defenses, they must come within even the Vulcan's limited effective range to hit their targets. Unlike modern armored attack helicopters, high-performance aircraft are extremely vulnerable to small caliber fire, such as 20mm.

First targets for attack aircraft are likely to be ADA units. Once ADA is suppressed, the subsequent missions against ground targets are at a much lower risk to the attackers. The wrinkle is that as soon as an aircraft dives to attack a gun, the pilot has just solved the gunnery problem for the gunner. Deflection and lead angle drop out of the equation, and the gunner has only to consider superelevation. That advantage, coupled with a high volume of fire, enhances the kill probability of guns versus aircraft in such engagements.

Effectiveness against helicopters is another problem altogether. The increasing ranges from which stand-off helicopters can fire at their prime targets — tanks — correspondingly reduce the kill probability of any anti-aircraft gun. The thing that we often forget, however, is that we don't have aircraft any low-altitude approach to the bridge, and at night prevented any aircraft from entering the defended area because of visual effects of tracer firing. At night, AW units fired on command at a designated elevation and along a designated primary target line, traversing slowly five degrees to either side of the line. This was a successful defense, although few aircraft were shot down at night.

A-10 pilots tell us of the difficulties of

visually acquiring and identifying targets under battlefield conditions at ranges much greater than four kilometers. Battlefield obscuration — the dust and smoke of battle — coupled with the fact that maneuver units habitually move using covered routes, means that the helicopter, like the airplane, will almost always have to move in closer than its maximum engagement range to identify targets. It is realistic to posit an attack helicopter, under such limitations, operating within a gun's effective engagement range.

Consider the helicopter at a range of three kilometers, hovering just above terrain mask and aiming an anti-tank guided missile (ATGM). It is conceivable that the pilot may never be aware that a heat-seeking missile has been launched at him, particularly if it misses. Indeed, it may miss, for there are a lot of heat sources on the battlefield, and infrared countermeasure technology, as well as infrared signature suppression devices, is progressing rapidly. In any case, early acquisition and early engagement would have no value because they did not disturb the pilot or distract him from aiming his missile at a tank or other high-dollar value target.

On the other hand, anti-aircraft gun fire has no such liability. Even if it doesn't kill the helicopter on the first burst, or even if it is not a particularly near miss, the effect of shells exploding around the helicopter will be to distract the pilot. The Army learned that lesson in World War I when the anti-aircraft artillerymen in France discovered that the true value of anti-aircraft fire was to "make him dodge, dodge, and drive

him up, up, up." In the case of today's helicopter threat, we might expect to drive him down, rather than up, but in either case the moment in which the ATGM is launched is postponed. Thus, without scoring a kill, the gun has *suppressed* the enemy aircraft and protected the maneuver force.

The utility of anti-aircraft fire against helicopters was emphasized in 1975 by Lt. Gen. (then Col.) Walter F. Ulmer Jr. when he reviewed its effects on his own operations in Vietnam. "A few anti-aircraft weapons," he wrote, "can raise hell with a wide range of activities." Among those activities were:

- Airborne forward air controllers were driven to higher altitude where their efficiency decreased and their target acquisition time increased.

- Helicopter gunship support was "significantly degraded."

- Aerial resupply operations became more complicated.

- Scouting effectiveness was reduced.

- Command and control missions were reduced because commanders could not linger at useful altitudes.

General Ulmer's conclusions have been underscored by some of the findings from Border Star 85. Aggressive air defense forced helicopters habitually to fly nap-of-the-earth. That sort of flying is fatiguing to aircrews and expensive in fuel, thus reducing mission duration. This, too, is a form of suppression, even when no shots are fired. We are aware that pilots change their mission profiles when they know they are facing anti-aircraft guns. The G-3 of the 14th AA Command, operating in the Pacific during World War II,



M-19 40mm AAA gun in Korea

reached the same conclusion many years earlier. He reported that enemy aircraft *avoided* areas known to be defended by AAA.

There are many specific advantages of guns. Guns come in all shapes, sizes, calibers and degrees of complexity. The simple gun, basically optically directed, offers many attractive features, shared in greater or lesser degree by the more sophisticated systems.

Guns offer what no missile system can offer — immediate visual evidence that we are trying to kill the airplane. The significance of such visual evidence has already been addressed in the case of the armed helicopter, but it's easy to overlook the impact of bursting shells in the sky. They have a real impact on the pilot, even when they miss. The instinct to avoid the threat, to live to fight another day, is a strong one. The psychological effects of gun fire are significant, and it's important to consider the matter of attacking the pilot, as opposed to simply attacking the aircraft.

The simple gun offers considerable resistance in an increasingly intense electronic countermeasure environment. It can continue to fire when radars are blinded and infrared seekers are decoyed. Basic guns, without radars, do not disclose the presence of the main body of the maneuver element by emitting radio frequency energy.

Guns are survivable. Their firing signature is small compared to a missile's launch signature. They are much easier to road march and move, making frequent moves, after firing, an attractive proposition rather than a restraining influence. Being smaller,

they are easier to emplace and camouflage. Simple guns have little ancillary equipment to generate radio frequency signals or large infrared images.

*Our contribution to the battle is in forcing the helicopter to make use of his ability to fire from extreme ranges, thereby reducing his first-round probability.*

Guns are much cheaper than missiles. The issue of cost effectiveness, much in the news lately, is an important one. When firing cheap shells, the gunner is unlikely to hesitate about firing at what might be a marginal target, making enemy pilots in the area very conscious of anti-aircraft fire and therefore cautious and more tentative. In contrast, a missile battery commander could hesitate to expend an expensive missile from his rather limited supply of missiles when confronted with a fleeting target. Guns are cheap to use. The gunner gets lots of chances to kill his target, at relatively low expense.

Guns are flexible. Employment of air defense systems is generally keyed to high-intensity conflict, but we can't ignore the medium- and low-intensity conflict. In fact, the United States has fought exclusively medium- and low-intensity wars since the end of World War II. In such a war, ground forces are likely to encounter various types of enemy aircraft, but in all probability would meet what we might describe as "vintage" aircraft. When combatting such threats (threats that have generally lower overall performance), guns are a more appropriate and cost-

effective solution to the air defense problem. Further, guns have the added utility of increasing ground-to-ground firepower in low-intensity battles, of which Vietnam is the perfect case in point.

Guns are reliable in battle and are tougher and harder to damage than missile systems, which are universally delicate and easy to put out of action at relatively small cost. Guns can be jolted and dragged over difficult terrain, handled roughly, treated casually, and the gunner still knows they will shoot. Because of their simplicity as compared to missiles, guns are more reliable in battle and easy for the gunner, as opposed to highly trained technicians, to repair.

Guns are easy to support in terms of logistics, particularly when compared to the extensive support organization and large prescribed load list for a missile battalion. A gun battalion requires minimal commitment of division support command resources and a much smaller number of people.

Most of these points refer to the optically directed gun, and radar-directed guns would not share in many of the advantages. It is possible to argue that a non-radar-directed gun is the solution for which we are all looking. High-tech solutions are appropriate in many areas, but not in all. We tend to overlook the power of the human brain as a computer and the human eye as a fire-direction system. In battle, the well-trained gunner can hit anything he can see that is within the range of his gun. This has been demonstrated time and time again by anti-aircraft gunners in all armies. When we are considering a gun for which the chief mission



M-42 "Duster," Vietnam



M-42 "Duster," Vietnam

is covering the dead zones of other systems and keeping the armed attack helicopter at arm's length, it may indeed be that buying a radar-directed gun is a case of gilding the lily. The cost factor certainly should be considered in the process of selecting an anti-aircraft gun.

The argument that guns cannot deal with the sophisticated stand-off helicopter of the next decade bears examination. We must consider that we have to fight throughout the spectrum of conflict, not just in the high-intensity battle; that we will be called upon to fight fixed-wing aircraft as well as helicopters; and, most importantly, that no ADA system, missile or gun, can combat stand-off helicopters with the capabilities that we are currently envisioning. If we design a six-kilometer system, the threat stands off at eight kilometers; if we make it eight kilometers, he ups the ante to 10 kilometers, and so on. The solution to that problem lies with someone other than the air defender, specifically our joint and combined arms team. Our contribution to the battle is in forcing the helicopter to make use of his ability to fire from extreme ranges, thereby reducing his first-round kill probability. In that mission, guns are critically important.

A much abused and underestimated capability of guns is their dual role as ADA guns and ground-support weapons. Whenever Army divisions have gone to war, the ADA battalion has always gotten into harm's way. One of the real advantages in having an ADA battalion, at least from the division commander's point of view, has always been in the enhanced firepower it gives

the division. As early as 1919, Col. Jay P. Hopkins, chief of the Anti-aircraft Service of the American Expeditionary Forces, recognized that the high-muzzle velocity of fairly heavy caliber of anti-aircraft guns in the forward zone logically gave the anti-aircraft battery another mission. He suggested that AAA could and should be used to counter the attacking enemy armored forces. Since that time, the hard school of war has found other uses for anti-aircraft battalions.

*... a battalion-sized element with a single-mission capability, armed with a weapon effective only against aircraft, would be a luxury.*

Divisional AAA AW battalions were crucial in Korea. The 15th AAA AW (SP) Battalion fought as the rear guard for the 7th Infantry Division in the retreat from the Yalu River in November 1950. The AAA battalions also fought as field artillery and provided final protective fires for the infantry throughout the war.

The ADA battalions assigned to duty in the Republic of Vietnam performed duties familiar to all of us. In addition to providing the firepower needed to defend fire bases, those battalions fired indirect fire missions and were the work horses of convoy protection. It is worth noting that the Hawk battalions did not play a part in these missions. In a low-intensity war without air threat, the missile battalions had no secondary mission capability. This highlights the key point about the dual role for

ADA units. Fighting the ground battle is not their principal task, but when divisions are seriously constrained in the number of soldiers and the amount of firepower they can have, the ADA battalion has to be in a position to contribute to the ground fight when circumstances require. A battalion-sized element with a single-mission capability, armed with a weapon effective *only* against aircraft, would be a luxury.

Whenever the ADA battalion goes into battle, it must have the ability to protect itself and the assets it is defending from ground attack. That means that the battalion must have a gun with which to repel all forms of ground forces, including light-armored vehicles. The value of anti-aircraft weapons in their secondary mission has been recognized for years. Ground commanders who have such weapons at their disposal have the ability to reinforce their artillery, anti-tank and anti-personnel resources at will. For the ground commander, the anti-aircraft gun is truly a valuable and flexible resource.

A big lesson of Grenada is that the world's least developed nations can obtain enough modern weapons to down helicopters. In the Grenada invasion, which started Oct. 25, 1983, the Marines lost three helicopters, two Cobra gunships and a CH-46E, to enemy fire. The Army lost one Blackhawk troop helicopter and had five others damaged, four seriously. Perhaps a better example, but with tragic results for the Army, of the use of AAA guns in their secondary role would have resulted if the enemy AAA guns had set their elevation properly — the Cubans had set their elevation at 800



Quad .50-caliber machine gun, Vietnam.

feet, and the Army Rangers parachuted from 500 feet onto the Point Salines Airport. Also, the original plan for the assault on Pearls airfield was to land one company by helicopters directly on the runway to achieve maximum shock effect. Luckily, the decision was made to use another landing zone approximately 700 to 800 meters southeast of the Pearls airstrip because, as it turned out, the airfield was protected by AAA.

Of course, there are those who still argue for an "all missile" approach. However, we should again take a lesson from history. The British fleet that sailed to the Falklands was defended almost exclusively by surface-to-air missiles. An article appearing in *The Atlantic* magazine in October 1982 reported that British planners had overestimated the capabilities of missiles, assuring the admiralty that guns and gunners had been rendered obsolete by electronics. The fighting revealed the shortfalls of high technology, though. All four British warships sunk were air defense ships relying on high technology and missiles, and all were sunk from the air. Only one of them was hit by a guided missile, the others were sunk by unguided bombs. The vulnerability of ships to low-flying aircraft resulted in a British attempt to purchase and install cannons on the decks of ships scheduled to sail for those islands, and Royal Marines were photographed setting up their machine guns all over the carrier *HSM Hermes* in an attempt to compensate for the fleet's unrealistic high-tech battle plan.

"British soldiers ashore were armed with Blowpipe and Rapier, but no AAA guns," *The Atlantic* reported. "Knowl-

edgeable sources said that Blowpipe failed to make a single hit, despite dozens of firings. Rapier was more effective, but it required so much setting up and calibrating that it often wasn't functional when attackers appeared. Rapiers on shore failed to provide cover for the assault ship *Sir Galahad*, sunk off the invasion beach at Fitzroy. The British claim to have shot down about 75 Argentine airplanes, two-thirds of them by Harrier fighters in air-to-air battles. Thus, the hundreds of advanced SAMs that the British took to the Falklands destroyed only 25 planes — planes that were 20 years old and had no radar jammers or other SAM-foiling devices."

One other vulnerability of missiles was pointed out in 1983 by an article in *Air Defense Artillery*. "Because Argentine aircraft flew at such low altitudes and the Blowpipe and Rapier sites were located so near sea level, several anti-aircraft engagements had to be rapidly terminated after missile launch to prevent the missiles hitting a ship when the aircraft being engaged flew behind it in the course of its attack."

However, the main point of this article is not to argue for a gun over a missile, but rather to stress that a mixture of long-, medium- and short-range missiles and guns, all differing in technology and operational characteristics, as well as in range and altitude capabilities, offers the best overall air defense for high-dollar value and priority assets.

As we progress with the essential spade work being done by the Forward Area Air Defense Working Group and the ADA Laydown Group (See "ADA Laydown," Page 11), let us keep in

mind the historical ADA gun lessons pointed out in this article and the operational advantages of ADA guns cited when examining the battlefield environment.

The bottom line is that I believe Army divisions need the anti-aircraft gun. The gun increases the threat to attacking aircraft and provides an additional means of repelling ground threats. It is survivable, durable, simple, light, robust, easy to fix and effective against both fixed-wing aircraft and helicopters. It has high utility in high-intensity conflict and may be even more critical in low- and medium-intensity conflicts. Guns cover missile dead zones and increase the threat to the attacker by broadening the spectrum of violence directed at him. Guns have faster reaction time, shorter projectile time of flight, and are better in situations where engagement space is constricted (urban, mountains, forest). Finally, guns, by virtue of the physical effects of gunfire, suppress all types of aircraft even when they don't shoot them down. The challenge for Air Defense Artillery today is to find the right sort of gun system to meet the threat — the realistic threat, not an assumed threat — and deploy it as quickly as possible.

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# Soviet Ground Air Defense Organization

by Capt. Brian E. Powers, USAF

(The views in this article are those of the author and do not imply indorsement by the Department of Defense, the Department of the Air Force or the Department of the Army of factual accuracy or opinion.—Editor)

According to *Air Force Magazine—The Military Balance*, the Warsaw Pact has earmarked up to 101 divisions for possible employment against Central Europe, of which at least 85 would face NATO's Central Region. A total of 58 divisions with 19,000 main battle tanks are currently stationed in East Germany, Czechoslovakia and Poland. This force includes 27 Soviet divisions, 20 of them in the Group of Soviet Forces Germany. Another 33 combat-ready divisions with 8,500 main battle tanks could move forward in a matter of days from the Baltic, Belorussian and Carpathian Military Districts located in the western regions of the Soviet Union.

In addition, 10 divisions, including the Southern Group of Forces of four divisions and 2,700 main battle tanks stationed in Hungary, could conceivably be launched against Central rather than Southern Europe if the situation warranted.

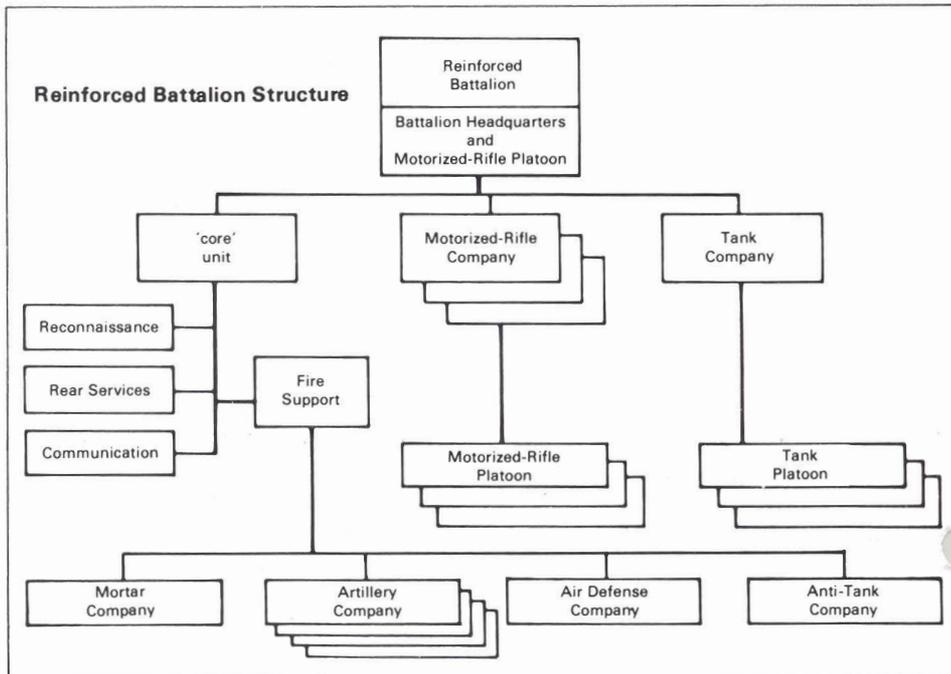
Included in these massive ground forces is the air defense network whose primary objectives are to limit the effectiveness of NATO air attacks, permit freedom of action for Warsaw Pact forces and gain air superiority.

The following examines the organization of the Soviet ground air defense network and the weapons assigned to defend the ground forces.

## Company-level Air Defense

The motorized-rifle company is the lowest echeloned unit that has its own

organic air defense section. Each company has a three-man air defense section; each soldier is equipped with an SA-7 Grail launcher. These SA-7s are usually employed as a section with the company commander retaining tight control of the gunners. In some situations, the battalion or regimental



commander of air defense may direct and control the employment of the companies' air defense.

The Soviets have great respect for the armed helicopter, which poses a real threat to their armor units. As a result, the Soviet and Warsaw Pact forces have placed great emphasis on defeating the helicopter and have made it a high-priority target for the SA-7 firing teams.

The SA-7 Grail is used for point defense to counter the helicopter and the slow, fixed-wing aircraft threat.

#### **Battalion-level Air Defense**

There is no known air defense unit organic to motorized-rifle or tank battalions in the Soviet army, although there may be an SA-7 section assigned for protection of the battalion command post or other points the battalion commander may designate. The primary means of air defense for maneuver battalions is usually provided by the air defense assets from the companies and those attached to the battalion from regimental or divisional assets. Such attachment is a general Soviet practice and is the rule when the battalion is engaged in any independent or semi-independent operation.

Air defense is also provided by those armored vehicles in the battalion that are equipped with vehicle-mounted anti-aircraft machine guns.

#### **Regimental-level Air Defense**

Soviet tank and motorized-rifle regiments have their own air defense battery equipped with the ZSU-23-4 self-propelled anti-aircraft gun and the SA-9 Gaskin. This gun-missile mix

gives the Soviets redundant capabilities with various frequencies, defense in depth and complementary systems.

The regimental air defense chief has the responsibility of planning and directing air defense activities within the regiment. He advises the commander on allocation and deployment of the regiment's air defense assets. He also has the authority to control the subordinate air defense section at the company level in some situations.

The regimental air defense battery consists of a headquarters, a platoon of four ZSU-23-4 guns, a platoon of four SA-9 launchers, and support and service elements. The regimental headquarters may have a section of three SA-7 gunners.

The ZSU-23-4 can be used against both air and ground targets and can fire on the move. However, the ZSU-23-4 is not a weapon without weaknesses. The on-board fire control radar is subject to ground-clutter interference when used against targets flying below approximately 200 meters; its mobility is hampered since it lacks an amphibious capability; it is only lightly armored and makes the crew of four highly vulnerable to tank, artillery and anti-tank fire; and its high rate of fire may put extensive demand on logistics to resupply ammunition during prolonged periods of heavy engagement. Finally, it also has cooling problems, which is why it normally fires only in 40-round bursts.

The ZSU-23-4 has a relatively small engagement envelope and should be considered a very limited-area or even a point-defense weapon. It is usually



The SA-9 Gaskin provides regimental air defense.

employed in pairs, with individual guns most frequently kept within several hundred meters of one another. When all four guns of the ZSU-23-4 platoon are employed together, pairs of ZSUs are usually kept within approximately 1,500 meters of one another in order to increase the engagement envelope.

Typical missions for these weapons might involve two or four ZSU-23-4s to protect a battalion in the regiment's first echelon or during a road march. During a march or pursuit, the ZSU-23-4s are deployed along the axis of advance. They are usually near battalion headquarters, although one pair is often at the head of the regiment while the other is at the tail.

Despite the countermeasures available to suppress or destroy the ZSU-23-4, it remains a very effective air defense weapon system. The ZSU has been in service with the Soviet army since 1965 and is still widely deployed. The gun demonstrated its lethality in the Middle East and proved to be one of the most effective of all the low-level anti-aircraft systems in the world. The major advantages of the ZSU-23-4 over earlier anti-aircraft guns are its mobility, integral fire-control radar and high volume of fire. It has the one big advantage of being able to keep pace with rapidly moving armored units.

The other half of regimental air defense is provided by a battery of four SA-9 Gaskins. The new SA-13 Gopher, thought to be a replacement for the SA-9, is claimed to have many similarities with the SA-9, among them the



A typical mission for the ZSU-23-4 is to provide defense for a tank battalion during a road march.

missile itself, which is generally estimated to be a solid-propellant weapon of about the same size as the SA-9. The SA-13 has a range-only radar with passive radar emission sensors for target acquisition and detection. It is also assumed to have a more advanced form of the passive infrared terminal homing to protect it from infrared countermeasures.

#### Division-level Air Defense

Air defense at the division level is significantly greater than that at the regimental level. Each of the Soviet motorized-rifle and tank divisions has its own organic air defense regiment. The SA-6 Gainful and SA-8 Gecko mobile, low-to-medium altitude, radar-guided missile systems have been replacing the older towed S-60 57mm anti-aircraft gun as the division-level air defense system.

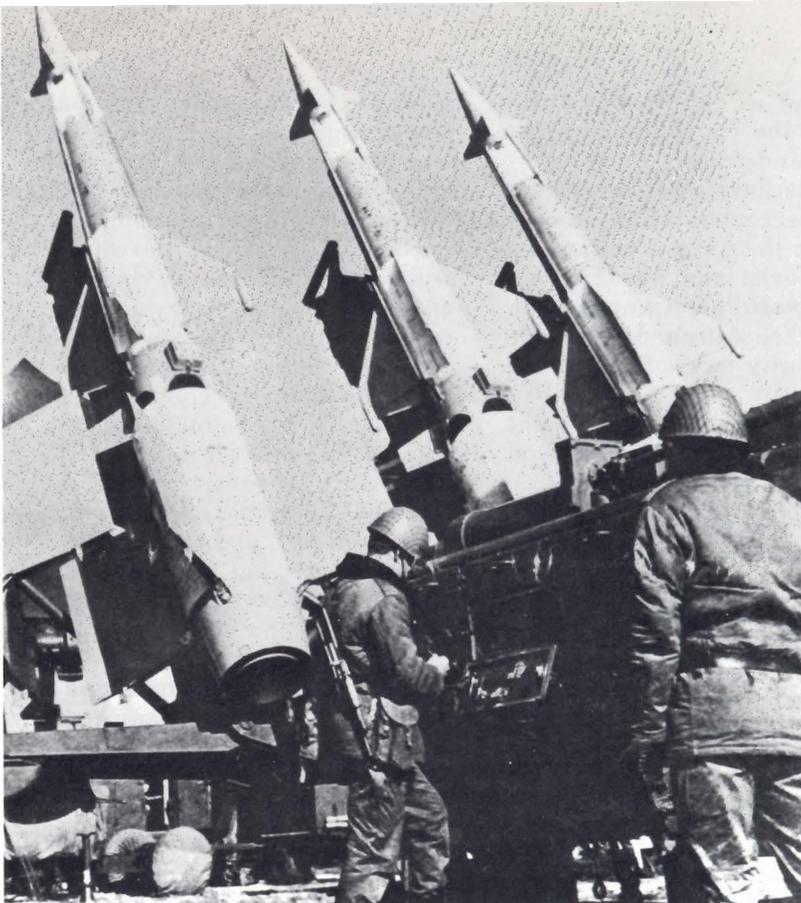
In those divisions still equipped with the S-60 gun, the air defense regiment has 24 S-60s organized into four firing batteries of six guns each. The S-60s are usually kept under the operational control of the divisional anti-aircraft regiment and are not attached to the tank or motorized-rifle regiments. Batteries are normally positioned four to five kilometers apart, providing interlocking coverage. Each battery can split into two three-gun platoons, two to three kilometers apart along the line of the march. A battery in this formation protects seven to eight kilometers of the column, while the full regiment protects 30 kilometers.

The SA-6-equipped air defense regiment has a regimental headquarters, five firing batteries with a total of 20 launchers, and support and service elements.

The SA-11 is believed to be a new land-mobile, short-range weapon that will eventually replace the SA-6. There are indications that the SA-11 is currently operating alongside the SA-6.

Divisional air defense is also provided by the SA-8, which is still widely deployed throughout the Soviet ground forces. Air defense regiments equipped with the SA-8 are probably organized similarly to those of the SA-6.

With the SA-6 and SA-8 systems, Soviet motorized-rifle and tank divisions now have organic air defense that can protect the entire division. Previously, these divisions could only rely on limited and restrictive air defense coverage from the S-60 batteries. The SA-6 is able to provide greater depth while the SA-8 is highly mobile and amphibious, which enables it to



keep up with ground forces in offensive operations.

#### Army-level Air Defense

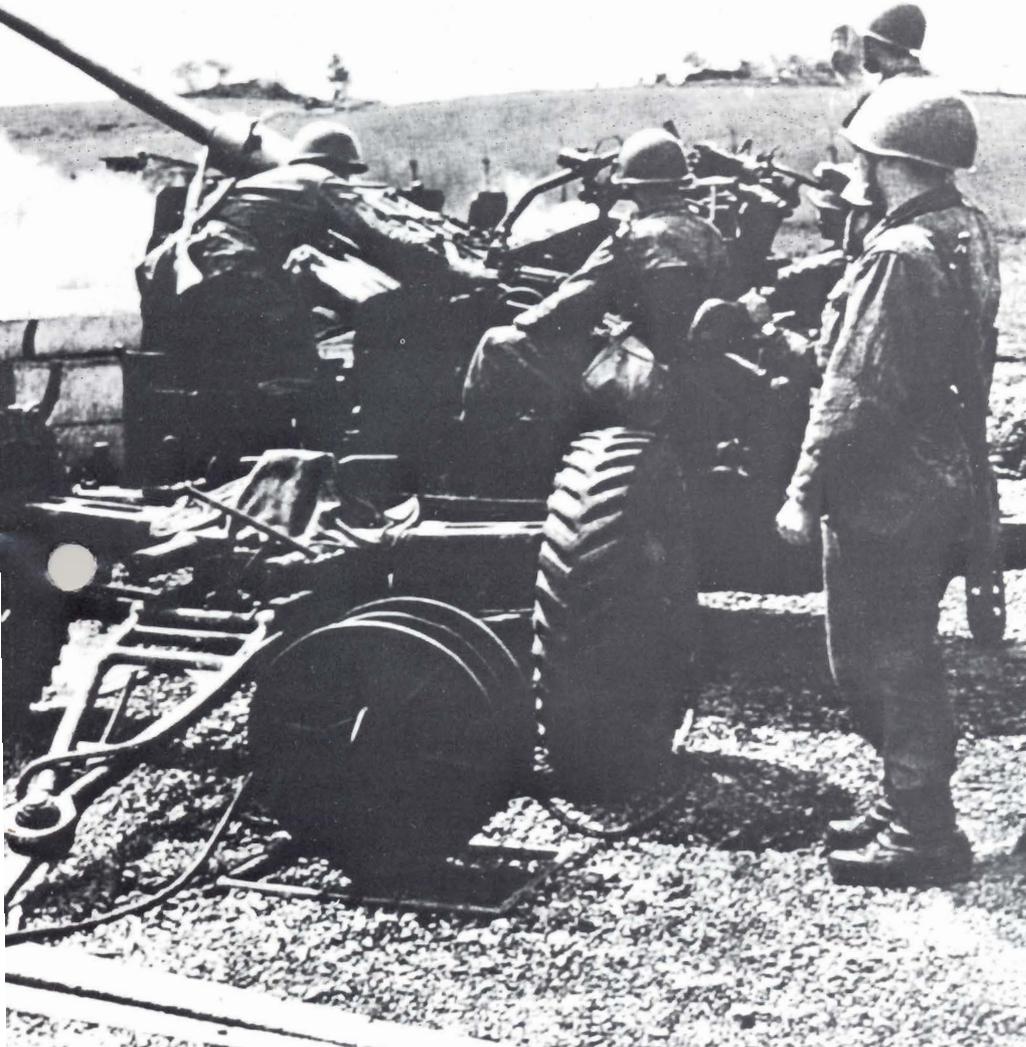
A Soviet army usually has one surface-to-air missile brigade equipped with the SA-4 Ganef. In the forward area, army-level air defense units augment divisional air defense capabilities against aircraft that manage to get past the divisional air defense systems.

The SA-4 is the only self-propelled, high-altitude, area defense surface-to-air missile system in service with any army in the world. The Soviets use the SA-4 for high-altitude protection of its

forward elements. The lead SA-4 battery would be 30 kilometers behind the forward edge of the battle area (FEBA) with the other batteries moving up in a belt some 15 kilometers behind.

An improved version, known as the Ganef Mod 1, which appeared in 1974, may have improved capabilities at lower altitudes. A likely follow-on for the SA-4 is the new SA-X-12 high-altitude surface-to-air missile. The SA-X-12 will use a phased-array radar system that can handle multiple targets. The SA-4 has been recently transferred to the Czechoslovakian and East German armies.

The SA-3 Goa (top left) is normally used for airfield defense. The SA-4 Ganef (bottom left) is the only self-propelled, HIMAD system in service with any army in the world. The SA-8 Gecko (right) is replacing the towed S-60 57mm gun (below).



### Front-level Air Defense

Front-level air defense is designed to provide, to the greatest extent possible, unbroken detection and engagement envelopes extending laterally across the entire front and forward of the FEBA over enemy territory. Gaps in detection and engagement may exist in some noncritical areas so that air defense assets can cover the main combat forces and other key objectives such as nuclear weapons storage and delivery systems. A Soviet front may have an SA-4 Ganef brigade and SA-2 Guideline units. SA-3 Goa units may also be

located in the front's area of operations. Neither the SA-2 nor the SA-3 are mobile; they are usually located well behind the FEBA, which reduces their effectiveness in providing close support to ground units.

The priorities for front-level air defense are troop combat formations and their supporting rocket and artillery units in march, prebattle or attack formations in assembly areas; command and control posts; and rear area objectives, airfields, bases, depots, communications facilities and support centers.

A typical SA-2 site includes six launchers placed around the fire-control radar. In support of front operations, the SA-2 provides area defense against medium- to high-altitude aircraft beyond the FEBA.

The SA-2, first introduced into service in 1958, has seen more combat than any other missile system. It was used by India in the 1965 war with Pakistan, during the war in Vietnam and in the 1967 and 1973 Middle East wars.

The SA-2 is reaching obsolescence. But since the Soviets are generally reluctant to discard from their inventory any weapon which continues to work reasonably well, it is likely that the SA-2 will remain in service for some years but in limited numbers. Its eventual replacement will probably be the new SA-10.

The SA-3 Goa also can be used for front-level air defense. Like the SA-2, the Goa is not very mobile and must be fired from a ground-mounted launcher. The SA-3 was designed to complement the SA-2 to hit aircraft at low and medium altitudes. But like the SA-2, the SA-3 is vulnerable to modern countermeasures. Unlike the SA-2, however, the SA-3 is currently in production and new sites are still appearing in the Soviet Union. The Soviets normally use SA-3s for airfield defense.

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### Suggested Reading

*The Soviet War Machine*, An Encyclopedia of Russian Military Equipment and Strategy (New York: Chartwell Books, Inc., 1978)

*Air University Review*, "Tactical Air Defense—A Soviet-U.S. Net Assessment," Maj. Tyrus W. Cobb (March-April 1979)

*Soviet Armed Forces Review Annual*, Vol. 6, David R. Jones (Florida: Academic International Press, 1982)

*Soviet Tactical Air Defense*, Maj. William H. Crutcher (Washington, D.C.: Defense Intelligence Agency, December 1979)

*Weapons and Tactics of the Soviet Army*, David Isley (London: Jane's Publishing Co., 1981)



## ADA's Raw Material

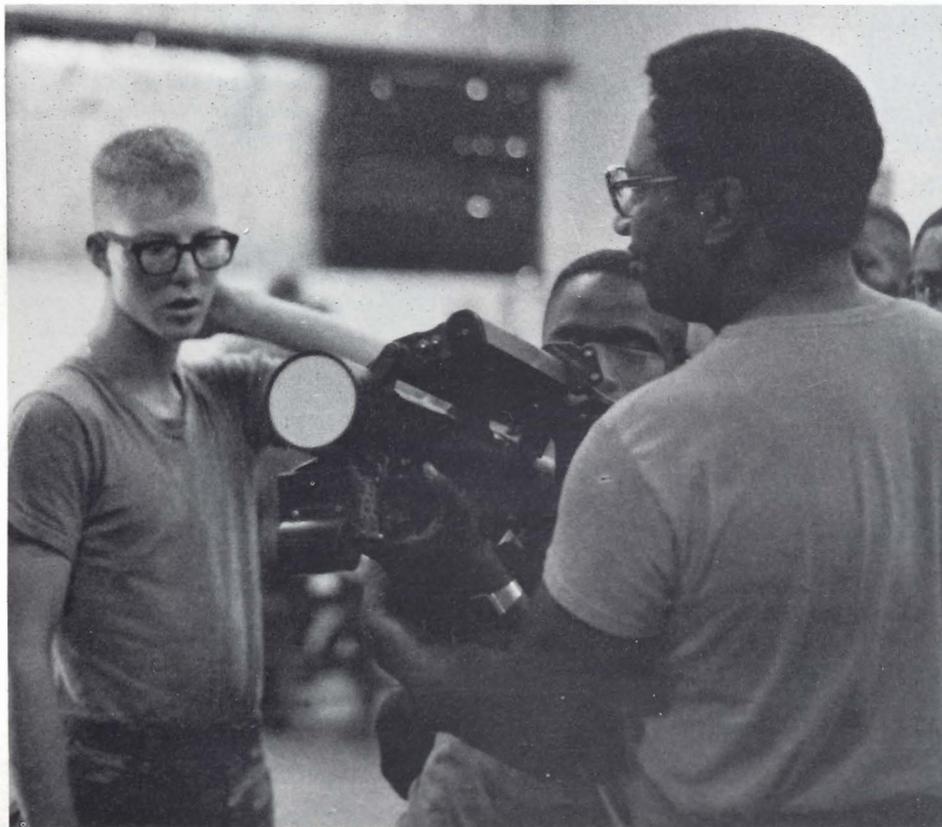
# QUALITY RECRUITS

Story by Barbara Sorensen  
Photos by Vaughn DeLeath Neeld

**D**avid J. Sargent is a MANPAD crewman, 16S, and holds the lowest enlisted rank in the U.S. Army. He has been neither a private nor a MANPAD crewman for very long. Much longer has he been a son of middle-class parents in Rosedale, Pa., an average student and a teenager who soaks up "heavy" rock 'n' roll. He was in kindergarten when the draft ended.

Unlike his Soviet counterpart, he has not had a gradual, lifetime indoctrination that prepared him to serve as a soldier. Instead, Dave talked with a local recruiter, saw a film on Air Defense Artillery and heard the words "travel" and "bonus" as the recruiter gave his pitch.

Dave soon became the "raw material" from which the cadre and commanders of a training battalion have to mold a competent soldier. Like most precious raw materials, Dave was expensive to come by and therefore vitally important to keep and appropriately manage. The process that





*Recruit David J. Sargent is the raw material from which training cadre must mold a competent air defender.*

transformed Dave from a civilian into a soldier is called "soldierization."

For drill sergeants Bobby D. Funk and Anthony R. Ortiz, 1st Sgt. Larry D. Bass and Capt. Thomas P. Carberry II, soldierizing Dave Sargent was to be a 14-week process. These men are members of Sargent's first Army unit, D Battery, 3rd Battalion, One Station Unit Training (OSUT), United States Army Training Center (USATC), Fort Bliss, Texas.

For Dave Sargent, soldierization meant that in 14 weeks he would have to be much more than an 18-year-old, fresh from the hallways of Technical Memorial High School, bent on traveling the world and pocketing a \$6,000 bonus. He must be an 18-year-old conditioned to respond to command, endure physical and emotional strain and successfully engage enemy aircraft.

The drill sergeants and commanders knew that trainee David J. Sargent

would have to go through a number of phases in order to become the soldier they were asked to develop. Dave knew he had joined the Army and, if he completed his training, he'd get a bonus and possibly be sent to Germany. Dave knew nothing of soldierization, but then he didn't need to; Dave was about to experience it.

Dave recalled his first notable experience. "They dropped us right away. They made us hold up our duffle bags. They were heavy. We were scared to let them drop. I looked around and some of the guys were pure white. I felt better then, because I knew I wasn't that bad off," explained the slender redhead.

The "duffle bag scene," as Private

Sargent refers to the incident, quickly accomplished two things; first, it startled the young man into realizing that he had a real obligation to respond like a soldier, and second, he could make it with the help of his friends.

This single incident, however, did very little to initially change Dave's priorities. He may have begun to respond in soldierly fashion, but he still was far from thinking like one. During his first weeks of training, missing his parents and three sisters, waiting to break into "crates" of cookies sent from home and adjusting to the closely cropped red stubble on his head were utmost considerations.

Alternating between rhythmically

rubbing the top of his stark head or pushing up newly acquired Army-issued glasses, he said, "I'm making a whole mess of new friends. I didn't know I'd miss my family so much; but I like sending advice to my little sister about boyfriends and stuff. I know the drill sergeants have to be hard on us. It's part of their act. And when they drop us, it's to build our upper-body strength. Right now I can't wait to get a pass so I can really eat. I don't know about this mess hall food. I've never eaten so much rice in my life."

As Private Dave Sargent finished Phase I of his soldierization, the basic soldier skills, he was a mixture of contradictions. Still tightly leashed to home and fast-food hamburgers, he also was drawn to his new friends and the perks of basic training — a pass.

Phase II of his training was a mass of individual challenges and sometimes monumental accomplishments as he went to "tent city" — two weeks of field training in the Texas desert. He learned to handle his rifle, set up a claymore mine, read a map, endure stress without complaining, survive on little sleep and still be alert enough not to encourage a rough retort from a drill sergeant. The private was physically taxed while being mentally bombarded with thousands of pieces of vital soldiering information.

"My friend's wife had their first baby while we were out here. I'm glad I'm not married. I mean I have my family to think about, but I don't have to worry about a baby or anything. I'm feeling stronger. I just get so tired. It's exciting. I've never done anything like this. I mean, I like to go fishing, but not in boats because I swim like a rock. This is something. I'm doing stuff I never thought I could. No, not that I couldn't, just that I never thought I would," he said, brown eyes widening with emphasis.

After two weeks of intense tactical-skill training and a strenuous road march, Private Sargent completed Phase II of his OSUT. During this time, the endurance he built up as a high school cross-country runner, won him the right to carry the 2nd Platoon guidon. "I like to run. I'm glad I do; they've talked to me about running marathons on weekends, but I'm not sure. I want to see Motley Crue [a current rock band] in concert next weekend, but first I have to pass our greens and locker inspection. I'm pretty confident though; I already bought the tickets," he confided.

Next, he and the 30 other soldiers of

2nd Platoon were ready to begin their military occupational specialty training to become MANPAD crewmen. "I chose 16S because I think more brains are involved. I like the electronics. It looked interesting. I wasn't stupid in high school so I figure after doing this four years, I won't be warped when I get out."

Phases III and IV were the weeks of MOS training. This training is conducted by instructors from the Short-range Air Defense Division, 1st Instructor Battalion, USATC. According to SFC Milton Kinnard, the instructors work at making the classroom area a much different environment from the unit area. "There's more freedom here.

**Still tightly leashed to home and fast food, he also was drawn to his new friends and the perks of basic training — a pass.**



We are not going to drop them or yell at them. We want them to learn. We want them to know that they can ask questions," he said.

Dave and his platoon were first introduced to their soon-to-be MOS by a rousing film. "Awesome. It was great to see what it [Stinger] could do," Dave said, as the lights came back on. "It's star wars."

The soldiers began instruction on the Redeye. As Dave, for the first time, took up the Redeye and placed it on his shoulder, he said, "This is it . . . something else. It's heavy."

Days followed that included classroom instruction, hands-on training with simulators and pass-or-fail tests. Dave consistently did well on the tests and his enthusiasm never dwindled with the simulators. "I like the training, but it's hard to stay awake. We get up so early, and we have to clean up and do PT before classes. Everytime the lights go off for slides, I fight the sleep. I've been drinking a lot of coffee. I want to learn, but it's exhausting. I'm too tired to think," remarked this soldier who no longer complained of homesickness.

Passing all the requirements on the Redeye, the platoon started Stinger training. Redeye compared to Stinger is like boy scouts compared to the Army, according to the crewmen. The troops were collectively excited about the Stinger. "It's the 'Big Daddy.' It's heavier than the Redeye, but it can do so much more," Dave said.

For the troops, another aspect of this phase was garrison training. They stood inspections, and participated in

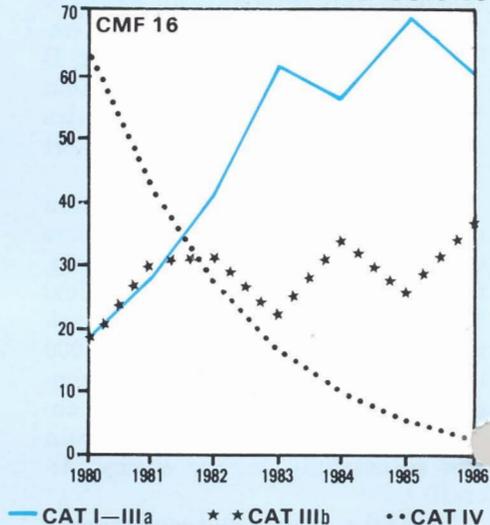
## Air Defense Artillery Recruit Quality Increasing

The mental category quality of soldiers enlisting in career management fields (CMF) 16 and 23 has steadily increased during the past six years.

Mental categories are based on recruits' scores on the Armed Services Vocational Aptitude Battery (ASVAB). To be a Mental Category IIIa or better, the score must be 50 or higher. A score of 31 to 49, on the ASVAB, is Mental Category IIIb. Mental Category IV is based on a score of 27 to 30.

In CMF 16 (D, E, H, J, P, R, S, T) the percentage of Mental Category I-IIIa has increased from 18 percent to 68 percent while the percentage of Mental Category IV has dropped from 63 percent to 5.8 percent.

### QUALITY OF ENLISTED ACCESSIONS



parades and change-of command ceremonies. Private Dave Sargent stood the dress-green inspection, hoping to qualify for a Saturday-night pass so he could use the concert tickets he had already invested in. "We went to the confidence course that morning. It's very physical, crawling under barbed wire and climbing hills. But I didn't

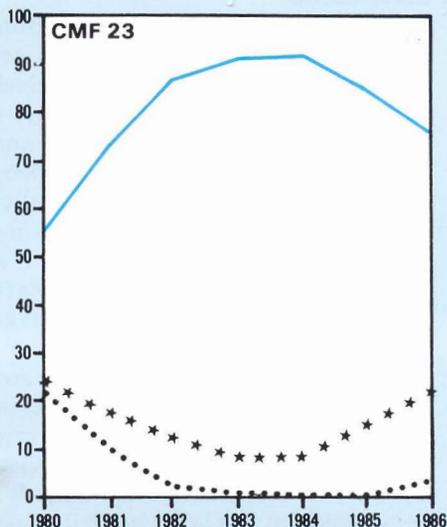
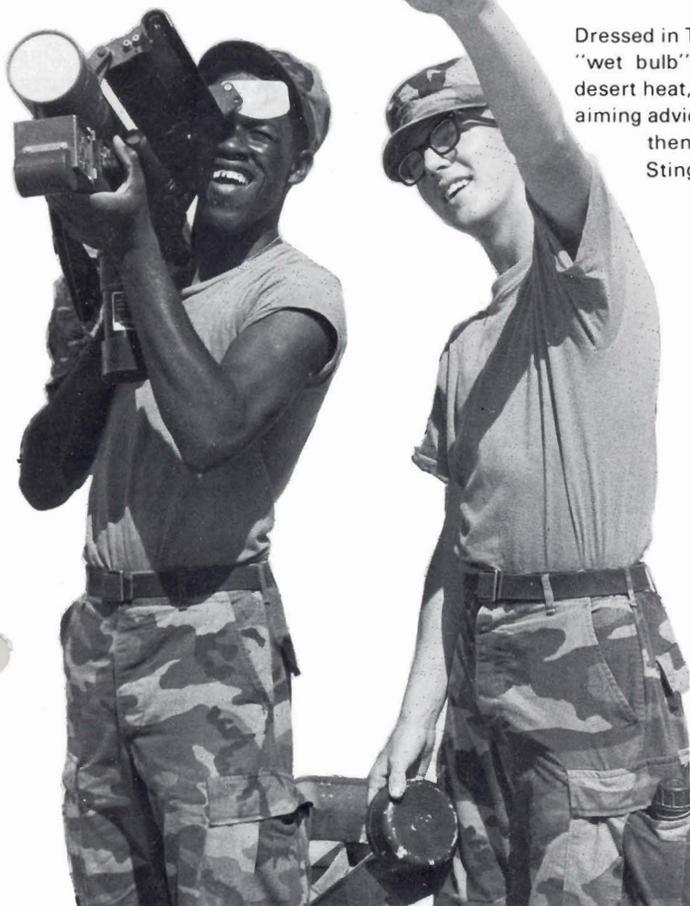
feel well. I was sick, in pain. I didn't go to the concert because I was sick," he said somberly, "even though I passed the inspection."

Back in the classroom, battling fatigue, diversions of any kind became a welcome relief from the daily grind. Though often warned not to randomly pick up the trainers and to "stay sharp" during the hands-on training, a soldier

swung around with the weapon on his shoulder knocking another to the floor. Laughter broke out, instructors got perturbed, but the afternoon was saved!

Training continued. The crewmen went through enemy-sighting drills. Sitting in their jeeps, they practiced spotting hostile targets, jumping from the vehicle to take their weapon from the shipping and storage container, executing all of the proper moves to raise their weapon and fire. During this drill, Dave experienced his most embarrassing moment. He was awarded a "Dummy Battery," (a fake Stinger weapon with the word 'dummy' written on it), for bending down and popping his knee joints, an admitted habit his drill sergeants did not find

Dressed in T-shirts and soft caps, the "wet bulb" uniform for Fort Bliss' desert heat, Pvt. 1 Gaylon Greer gets aiming advice from Pvt. Sargent, who then takes his own turn on the Stinger field handling trainer.



1980 - 1985 Air Defense Artillery Proponent Office Historical Data  
1986 - U.S. Recruiting Command - Mission for FY 1986

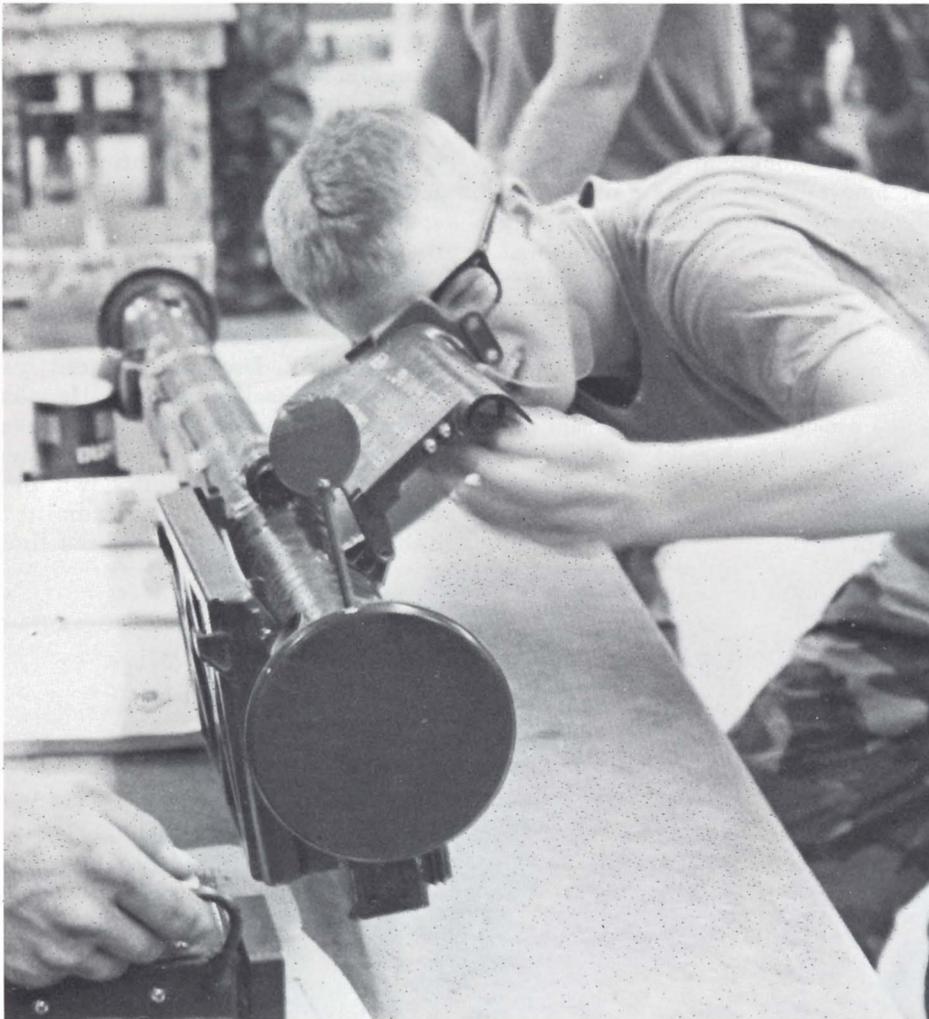
In CMF 23 (24C, E, G, M, N, T, 25L, 26H) the percentage of Mental Category I-IIIa has increased from 54 percent to 84 percent, and the percentage of Mental Category IV has dropped from 21 percent to 0.

This potential for better air defense artillery soldiers is further encouraged with educational and enrichment programs. Incentive programs are built into CMF 16 for new recruits, such as enrollment in the Army College Fund (see DA Circular 621-85-2), two-year tours and, for MOSs 16P, R, S and X, a \$6,000 bonus on a four-year enlistment; 16X is the feeder MOS for 16D, E and T. There are no special incentive programs presently in effect for CMF 23.

amusing. "Sergeant Funk really got on me. I hated having to carry that around, just for cracking my knees. But I practiced the drill until I went from taking 15 seconds to complete the drill down to 6.9 seconds," he said.

Dave's embarrassing moment will fade in time, but a friend of his may not be as lucky. "We were doing something one day, and the drill sergeant wanted to catch Eric's attention. He called him 'Bugs,' and we wouldn't let it drop. Everyone calls him that now," he added.

The MANPAD crewmen tracked radio-controlled aircraft targets one afternoon, and shouts of advice and encouragement rang out constantly. "Take 'em out, take 'em out," soon became the chant as the target swept by. According to instructor, SFC Carl Dick, "This is a new one. We've heard them shout things like 'bring them



Pvt. 1 Dave Sargent discovers the Stinger as part of his MOS training. Known by the trainees as the "Big Daddy," the Stinger weapon quickly became a favorite topic.

down,' or 'kill them,' but I've never heard 'take 'em out' before. I wonder if it's from video games?"

Video games or not, soldiers worked hard in the desert sun tracking the targets; they were all vying for the privilege of shooting a live Redeye missile at the end of their training. The soldier chosen would have to be the most well-rounded in his MOS skills. Dave was not chosen to fire the Redeye. Though he consistently scored high on his tests and executed his drills well, the instructors felt that one of his peers had done better. Dave, however, remained loyal to his blossoming job. "The Redeye is a good weapon, but the Stinger makes it look sick. The Stinger is the ultimate. There're no faults in it. The faults are in the operators," he judged.

Dave began the final phase of training. Phase V continued the MOS training, but included testing of other military skills and a physical-training test. Bending and stretching, flexing knees that "always" crack, Dave readied for his PT test. He chalked up

perfect scores on sit-ups and push-ups. But the cross-country runner missed a perfect score on the two-mile run by seconds. Though 18 soldiers in his battery scored 300 on the test, a perfect score, Dave finished with 296 points. Though not entirely pleased, he was able to recover from the disappointment.

There was a growing sense of exhilaration and, yet, familiarity as Dave's training was nearing its end and the routine was settling in. Talk among the young soldiers turned to expectations about Germany. According to Capt. Carberry, "Many of the soldiers in Delta Battery are headed for Germany."

"I really want to go to Germany. I'm really glad that's what I got orders for," Dave said. His orders, like the others, were not announced to him until their training neared its end. There were strong psychological reasons for delaying the notice, according to SSgt. Funk. "If a guy wants Georgia and he gets Germany, there could be a morale problem. He might even pur-

posely flunk the course. We'll tell the married guys in time to settle affairs with their families, but we find it's better to not tell them too soon," he said.

Becoming more "seasoned" trainees, the troops began to be a little more daring. "We wouldn't talk back to the drill sergeants or anything. But we did have our fun," Dave baited. Fun included "jamming on a broom stick" while listening to rock 'n' roll and taking instant pictures of guys in compromising positions when off guard. But, Dave claims his most daring prank during his 14 weeks happened while he pulled fire guard. During his two-hour watch, he sprayed shaving cream on his sleeping squad. "They promised to get me back for it, but nothing's happened yet."

Hard knocks, hard training, figuring out the "ropes," learning the job and playing pranks are common memories for anyone who has gone through initial-entry Army training. A 10-year veteran of Air Defense Artillery, SSgt. Ortiz, remembered much of the same; but he also pointed out real differences in the training program and the soldiers.

Like Dave, Ortiz was introduced to Air Defense Artillery through a recruiter's film. "We were 16Ps, Chaparral and Redeye. But in our initial MOS training, we just got the basics. Today, they are trained so well that I believe they're ready to go straight to the field and do their job. The training is good," he said.

Ortiz also thinks that today's recruits are "well rounded and capable. I think their attitude is a lot better." However, Ortiz worries about what will happen to the young men he trains when they arrive at their first permanent-party assignment.

"This is a pretty controlled environment. The guys thrive here. We are concerned about them around the clock and in all aspects of their welfare — their health, education, family and morale. The section leaders out there have to do the same. These are quality soldiers. But it may be their first time away from home. A section leader has to keep an eye on these guys. He has to keep the momentum going, not let it go sour," he said.

Ortiz remembers that most of his section chiefs, years ago, had been reclassified into air defense, the new Army branch. "We had to learn a lot together. But they cared, and we did fine. We have quality in this branch. Air defense soldiers carry a lot more responsibility at a lower rank than many MOSs. For

instance, MANPAD crewmen are often out in a jeep by themselves. They have to keep their head, be alert and practice expert map-reading skills. I've seen it in Europe. Our troops do it.

"First-line supervisors have to set an example. They need to motivate, get the guys in the Army Correspondence Program. Watch out for their families, show concern. This can't be eight-to-five. Build on what these soldiers know; they can do the job," he emphasized.

At last, graduation day for the battery arrived. Private Dave Sargent was selected to be the battery guidon bearer for the graduation ceremony.

Guest speaker, Command Sergeant Major Larry J. Hampton, United States Army Sergeants Major Academy, told the graduating soldiers that they had three responsibilities: first, to build and improve on their new skills; second, to care for and write to their families and loved ones; and third, to enjoy themselves in Europe, increase their education and save their money. He also recapped their 14 weeks of training and confirmed that they were all "fully-qualified air defenders."

Carberry congratulated the troops, passed out awards and spoke about the things to come, their need to protect and defend their country, and his belief that they would.

Suddenly the ceremony was over, the soldiers yelled in practiced unison, "fit to fight," and then passed in review. With a less than concealed smile, Private Dave Sargent skipped into step



Lt. Col. Larry Lovell, battalion commander, challenges Dave to do his best in his assignment to Germany.

and proudly carried the guidon off the field.

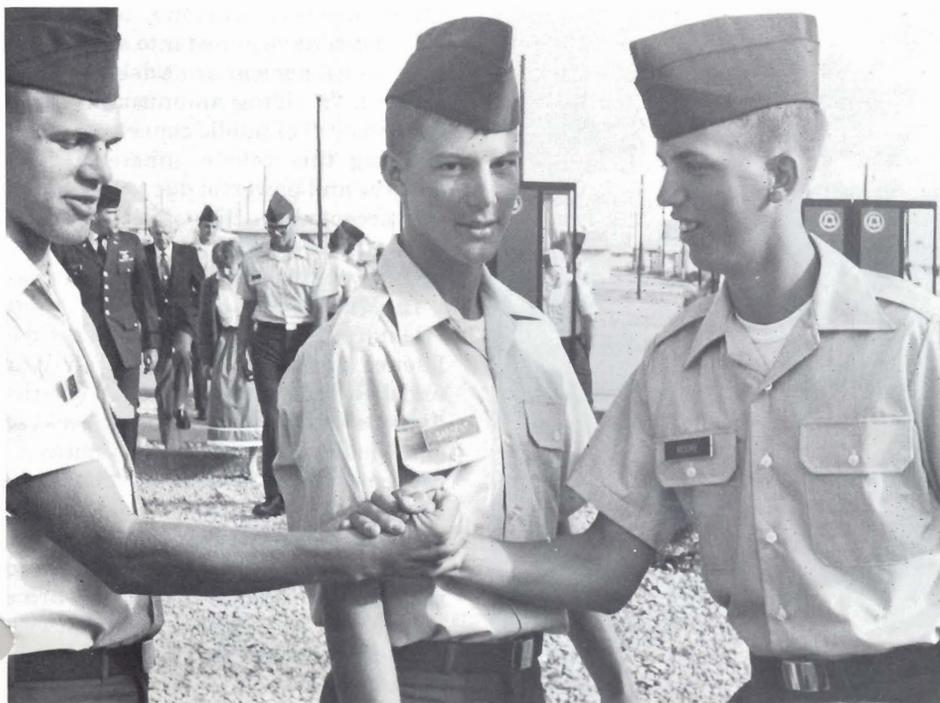
For a few short hours, these soldiers stood on the line between their past and their future. They had just come through a rigorous soldierization process. They had just publicly accepted

their fate as soldiers, as well as the hugs and kisses from the "folks back home."

Sargent was as hyper as his friends, eagerly making introductions, showing off snapshots and recounting "war" stories as quickly as they came to mind. In a moment of reflection though, he said, "I know I can do my job. Every soldier's part on the battlefield is important. I don't get chills thinking about what I may have to do. If I fire my Stinger and miss, that will give me chills. I know my responsibility.

"I don't know if I'll stay in the Army, but I know I've changed. I've become a soldier, and even if I go back home, part of me will remember the Army," he said.

Being a soldier means responsibilities. The cadre of the training battalion had the responsibility to turn Dave into a soldier, while Dave had a responsibility to become a soldier. Those with whom he comes into contact have a responsibility to him, and his peers, to continue to train him, to care for him and to manage him appropriately as a soldier. Private Dave Sargent is no longer a "raw" recruit, he is now the most important product this Army can produce, a soldier who accepts his responsibility.



Privates Lyle Holt (left) shakes hands with Eric "Bugs" Moore as Dave realizes making new friends, and quick farewells, are a fact of military life.

# American Myths, Legends, Illusions

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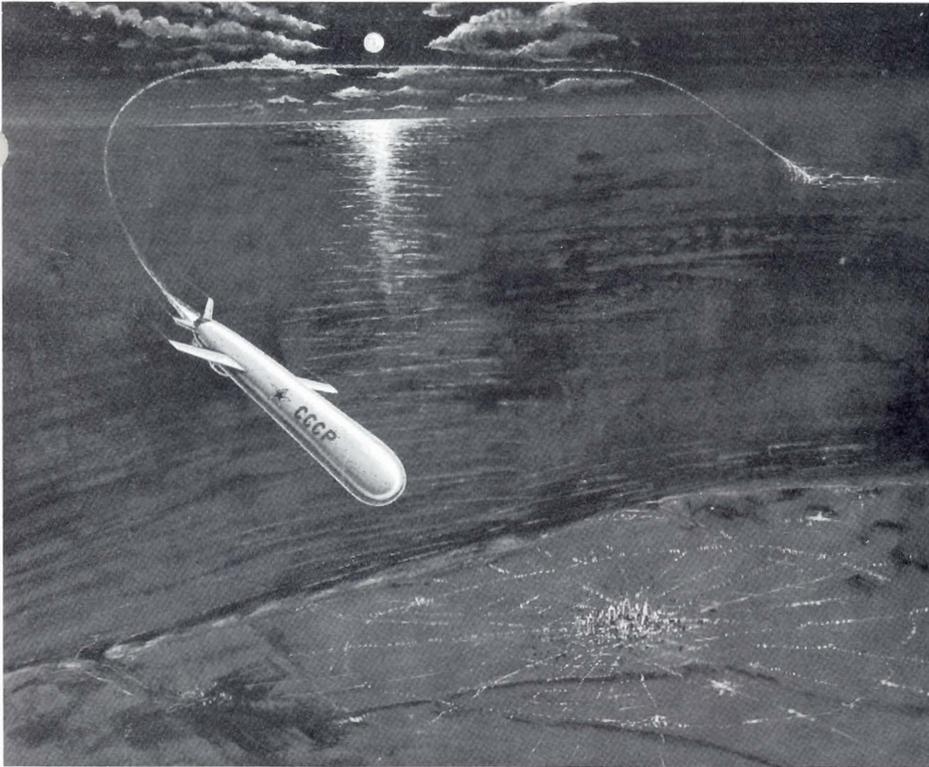
by Maj. Greg H. Parlier



Concerned Americans have recently come to realize that detente and the "lessening of tensions" among the superpowers during the 1970s has been a largely futile effort now resulting in serious foreign policy consequences. Many now acknowledge that our once unquestionably superior strategic deterrent has become questionable. In fact, there are experts who seriously question even parity among our strategic nuclear forces. This erosion in our nuclear deterrent capability, especially as perceived by our allies, potential enemies and Third World nations, seriously jeopardizes not only U.S. interests but also fundamental Western collective security policy. Recognizing genuine and undeviating Soviet objectives forces one to conclude that severe consequences loom for U.S. foreign policy and for our ability to effectively pursue those goals commensurate with our national interests.

Many elements within America and other Western nations, especially European, have joined into an increasingly vocal nuclear arms debate which seems to be riding an unusually large groundswell of public concern. A voice entering this debate, inherently persuasive and powerful due to the generally accepted sanctity of its judgment, is that represented by the collective opinions of the U.S. Catholic bishops.

In May 1983, they released their "Pastoral Letter of the National Conference of Catholic Bishops on War and Peace." I have chosen to use the bishops' letter as a focal point because it embodies and perpetuates many of those peculiarly American "character traits" inferred by the title of this article, and because, nearly three years after its release, the letter continues to play an important role in the arms debate. The U.S. Catholic bishops (with emphasis upon U.S.) have seriously questioned, and essentially condemned, the validity of deterrence as a morally acceptable strategic policy.



The submarine-launched SS-NX-21 cruise missile has a range of 1,860 miles and can be fired from standard-size Soviet submarine torpedo tubes. (DoD artwork)

Others differ significantly in their perceptions. They suggest a dangerous parallel between the current situation and that which prevailed on the eve of World War II when the Free World failed to perceive the events which were in motion and pursued policies which invited, rather than prevented, aggression.

One of the fundamental purposes behind the release of their letter is the bishops' intention to offer a moral and religious contribution to the growing public debate on the dangers of the nuclear age. As Cardinal Krol emphasized, it was offered as an alternative means of encouraging public debate, rather than as an ultimatum for public policy. While acknowledging that their contribution is neither technical nor political in scope, their Pastoral Letter is nonetheless a comprehensive treatise on religious perspectives and principles. It includes a lengthy discussion on how such principles should be applied to the problems of American national policy formulation in the nuclear age. A variety of issues, ranging from abortion and conscientious objection to deterrence and the just-war concept, are analyzed within the context of the teachings of the Catholic Church.<sup>1</sup>

Such a contribution is not only permitted by rights and freedoms in our democracy, but also encouraged by the moral and ethical precepts upon which our concept of justice is founded.

Although others have expressed sentiments to the contrary, I have no intention of criticizing the Catholic bishops for "meddling in governmental affairs" and certainly do not view the Pastoral Letter as any encroachment upon our concept of the separation of church and state. Furthermore, it is already evident that the letter's purpose, as Krol anticipated, is being

### **An assessment of the current strategic balance reveals that in most categories the Soviet Union has surpassed the United States.**

realized; it has sparked public debate and, no doubt, will continue to do so.

From my perspective, the Pastoral Letter also provides an even more important and significant opportunity. While contributing to and furthering general public debate is indeed a worthwhile effort, the degree of knowledge and objectivity characterizing such debate will be of crucial significance to its ultimate legitimacy and validity. Injecting myths, promulgating legends and wishful thinking, engaging in emotional rhetoric and disregarding the cold, stark facts contribute toward useless dialogue which, under normal circumstances, may be of little or no consequence. However, public debate on the nuclear arms race

and national policy based upon illusions and wishful thinking will, in this nuclear era, indeed have profound consequences for our nation and Western civilization in its present form.

It is not enough to merely contribute to the general public debate. What is vitally needed are contributions which lend objectivity and validity to an *informed* public debate. A worthwhile discussion of our strategic posture must consider both the current predicament in which we find ourselves and the reasons why we allowed such a situation to develop. Within this context, an informed public debate, including moral and ethical judgments on alternative national strategies and policies, can have great value and significance. However, any public debate which lacks the basic and fundamental understanding of reality such a context provides will be doomed to failure and serve only to fuel the fires of ignorance and illusion.

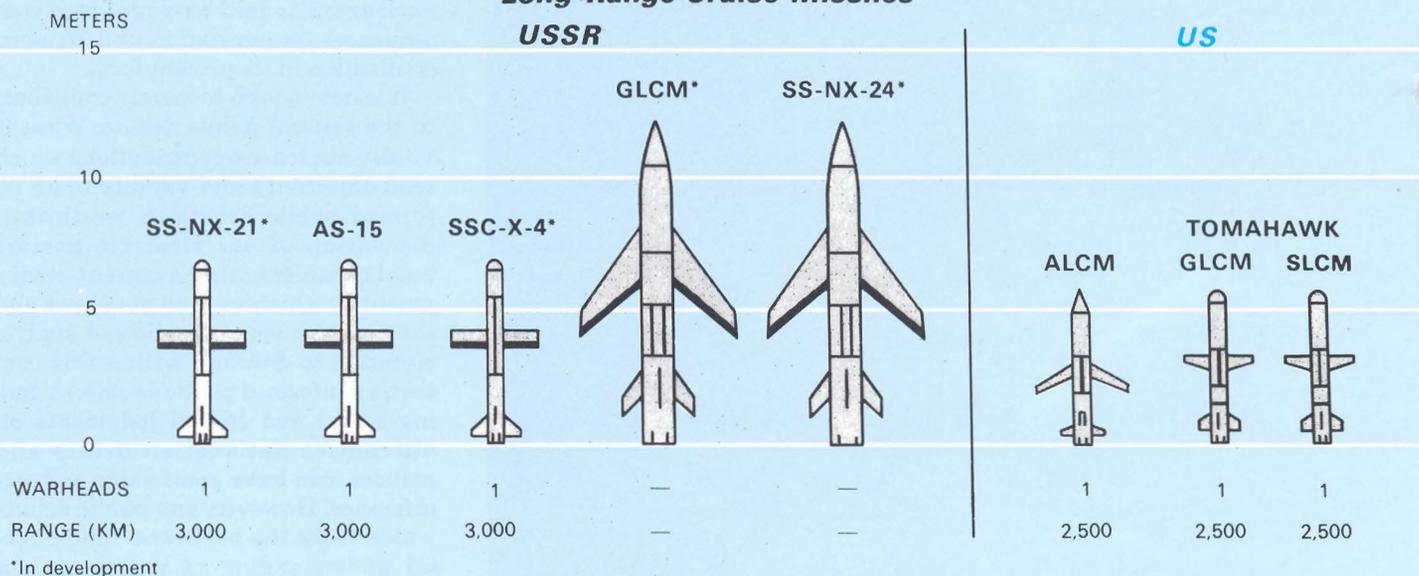
Since the end of World War II, there has existed a widespread perception that U.S. strategic forces possessed superior capabilities. To a great extent that perception still exists today, yet it is no longer substantiated by fact. During the past two decades, the Soviets have embarked upon a massive buildup and modernization of their strategic and conventional forces. During the 1970s, while U.S. defense expenditures were steadily declining, Soviet defense outlays were steadily increasing by an annual average of four percent. Their strategic forces spent more than two-and-one-half times what the United States spent on procurement. As a result, an assessment of the current strategic balance reveals that in most categories the Soviet Union has surpassed the United States. Their intercontinental ballistic missile (ICBM) force now contains 1,400 launchers with more than 5,000 warheads compared to 1,037 launchers and 2,150 warheads for the United States. The Soviet ICBM force has about twice the area destructive capability, twice the throwweight, three times the megatonnage and five times the hard-target kill capability as that of the United States.<sup>2</sup> Unlike the United States, they also possess a significant reload capability.

The Soviet ballistic missile submarine force now has more submarines (62 versus 34) and missiles (950 versus 568), but fewer warheads (2,000 versus 5,000) than the U.S. force. Although our submarines are relatively "quiet" and therefore more difficult to detect,

## Long-Range Cruise Missiles

USSR

US



their submarine shipbuilding program is progressing at a rate four times greater. Each new Soviet Typhoon class submarine, when launched, carries 200 warheads. Furthermore, the bulk of U.S. submarine-launched ballistic missiles (SLBM) is much less capable in terms of range, accuracy and yield. Hence the current advantage in overall capability for the U.S. SLBM force is rapidly diminishing.

Soviet heavy strategic bombers (excluding the Backfire, which the Soviets contend is not a strategic bomber) number less than half the U.S. bomber force (150 versus 375). However, if the Backfire — which is being produced at the annual rate of 30 and, when refuelled in flight or intermediately staged at a Soviet proxy nation, can hit targets anywhere in the United States — is included, the disparity is much smaller (350 versus 375). The Soviet bomber force is considerably less capable than the U.S. bomber force, which is now equipping its bombers with long-range cruise missiles. However, they have recently flight tested a new intercontinental bomber, the Blackjack, which is similar in appearance, but slightly larger than the B-1B.<sup>3</sup>

In the area of strategic defensive systems and programs, the Soviets have devoted considerable effort to a nationwide air defense network, a vigorous anti-ballistic missile (ABM) research and development program, and an extensive civil defense program which alone has an annual equivalent budget of \$3 billion. Currently the United States has essentially no civil defense

capability.<sup>3</sup> With the exception of our strategic early warning systems and five squadrons of interceptor aircraft, the United States has had no strategic defensive systems since the Safeguard Ballistic Missile Defense was deactivated in 1976. Continuing increases in Soviet strategic offensive power coupled with this lack of our own strategic defensive capability has created a

**The Soviet Union now possesses a substantial first-strike capability as well as a sustained war-fighting capability.**

moral dilemma by allowing Western society to essentially be held "hostage." While the mutual assured destruction (MAD) concept acknowledges such a predicament, today this concept is regarded by the current administration as morally unacceptable. The attempt to find a way out of this moral quagmire culminated in President Reagan's announcement to pursue a long-term research effort — the Strategic Defense Initiative.

The present situation, as evidenced by these somber facts, reveals that any perception of U.S. superiority in strategic capability is clearly unwarranted. While knowledgeable people may argue over the degree of the imbalance in strategic forces, the simple facts are that the Soviet Union now possesses both a substantial first-strike capability as well as a sustained war-fighting capability whereas the United States possesses neither and has marginal

capacity to absorb either. Our strategic deterrent capabilities must certainly appear less ominous to the Soviet leaders now than they did during the Cuban missile crisis. One should ask how and why we allowed such a situation to develop and what the future implications are of Soviet dominance.

First, it is imperative to recognize that, despite our desires to the contrary, the leaders of the Soviet Union are not bound by the same moral and ethical precepts as we are. We have continued to view the Soviets as though we were looking through a window when, in fact, we were simply looking at a mirror. Our perceptions of their intentions, much less their capabilities, have been seriously flawed in the past. We must recognize that they are motivated by concerns that are not comparable to our own. Failing to recognize and account for such disparities in ideology and intentions will continue to result in their growing predominance in world affairs, regardless of how abhorrent their techniques may seem to us. They are not restricted from using what we would readily classify as evil means to achieve their ends. Quite the contrary is the case.

The Soviets view the world as a struggle between two differing social systems: socialism and capitalism. Their ultimate objective is the destruction of capitalism on a worldwide scale. They are guided by their revolutionary ideology of Marxism-Leninism which regards capitalism as the main obstacle threatening the progression and development of human society. Consequently, all actions and means of any

form that further that objective are justified and encouraged by their ideology. They use Marxist dialectics rather than some form of deductive reasoning, as we would, and are governed by a completely different set of moral laws and behavior.

The unmistakable tenet of Soviet military doctrine is that the Soviet Union will strive both to "prevent" and prepare for war so that if war comes, despite all efforts to prevent it, the Soviet Union will be victorious and will recover from it.<sup>4</sup> Once we have recognized such vast asymmetries between our two nations, we should no longer be surprised by their behavior. Rather, we should anticipate and account for such differences, as opposed to simply hoping that they will react and perform as we wish, using logic and rationale similar to our own.

It has become clear that the Soviet leadership does not, and probably never did, subscribe to the MAD concept. Instead, they have pursued a war-winning strategy. Consequently, they have used "detente" to their own benefit and viewed it as an opportunity to improve their military posture while we presumed it to be a period for "lessening of tensions." It is, nonetheless, doubtful that the Soviets desire a nuclear war. In fact, their European strategy is clearly designed to preclude, by conventional pre-emptive means, the possibility of nuclear escalation by NATO forces. They fully recognize the massive destruction that would ensue.

Furthermore, such destruction would be counterproductive to their ultimate goal of "liberating" the people, and from a less ideological perspective, would not enhance an already dismal economy. Instead they view their power as a means of achieving their goals through intimidation and coercion without resorting to nuclear warfare, or for that matter, any other kind of warfare.<sup>5</sup> Therefore, a clear and realistic appraisal of both their intentions, as well as their capabilities, uncluttered by wishful thinking, is absolutely necessary if we are to pursue effective debate on a rational military strategy.

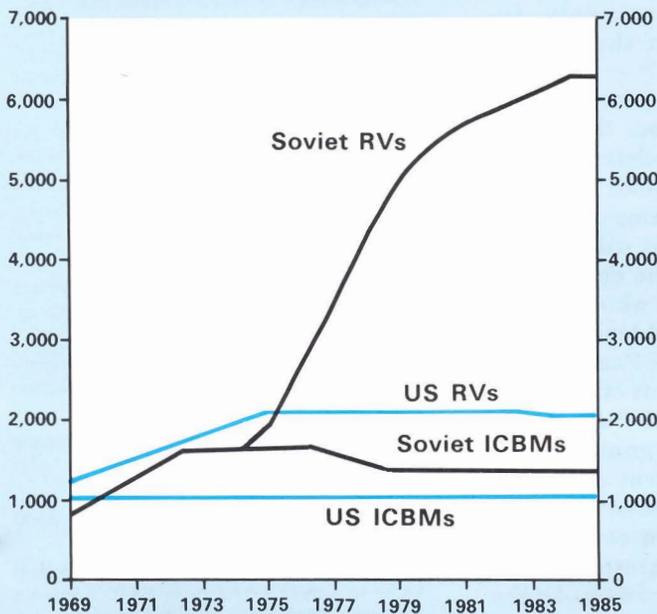
**"When we build, they build. When we stop, they build."—former Secretary of Defense Harold Brown**

Finally, we must recognize flaws in our strategic thinking and ensure that correct lessons are derived from past mistakes. Inherent in such a forthright analysis is the need to destroy damaging myths and perceptions which have, all too often, contributed to distorted thinking and unsound policies. While the MAD concept, which gained acceptance in the mid and late 1960s, has been the foundation of our deterrent strategy, we must recognize that the Soviets have not followed suit. They do not regard a nuclear war as unthinkable or unwinnable. They have pursued

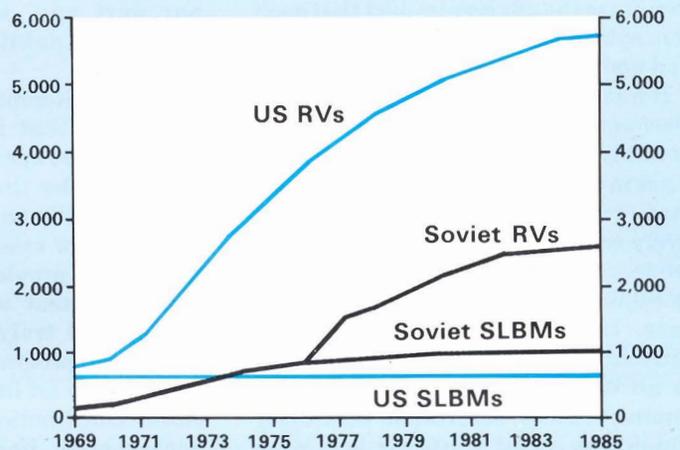
an offensive-oriented strategy of war-fighting capability rather than a deterrent-oriented strategy of assured destruction. As former Secretary of Defense Harold Brown said, "When we build, they build. When we stop, they build." We must recognize that they now have, and are continuing to pursue, military capabilities to support their avowed intentions of world domination which is clearly imbedded in their ideology.

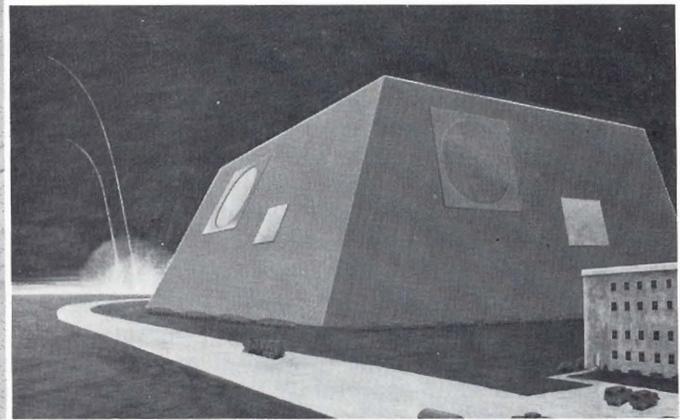
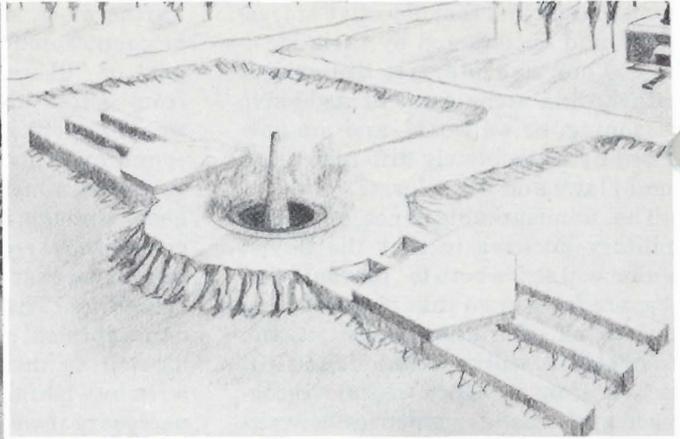
While recognizing the unimaginable power and destruction that nuclear weapons can unleash, it is nevertheless true that we have allowed ourselves to be deluded by false rhetoric. An obvious example is the often heard assertion that we continually overestimate Soviet capability and, as a result, unilaterally propagate an ever accelerating and costlier arms race. Such is not the case, however, when one examines the facts such rhetoric suggests. An objective appraisal of our intelligence estimates reveals that we have seriously underestimated Soviet capabilities in the past.<sup>6</sup> Furthermore, the notion that the United States is continually precipitating the nuclear arms race is simply false. In fact, the word "race" is entirely misleading. An analysis of various quantitative indicators of nuclear firepower potential reveals that our strategic capability actually peaked in the early 1960s and has declined, not increased, since then. Total megatonnage, numbers of warheads, average warhead yield and

**US and Soviet ICBM Launcher and Reentry Vehicle (RV) Deployment 1969-1985**



**US and Soviet SLBM Launcher and Reentry Vehicle (RV) Deployment 1969-1985**





The Moscow ballistic defenses include Galosh anti-ballistic missile interceptors, above left, new silo-based high-acceleration interceptors, top right, and the Pushkino ABM radar, bottom right. (DoD artwork)

equivalent megatonnage have all decreased as has the real dollar costs of our total strategic offensive capability.<sup>7</sup>

The often-used phrase "strategic arms race" is clearly unfounded as a detailed analysis of our evolving strategic posture will show significant declines in many areas, including real costs. This is precisely the converse that the rhetoric of the day would lead one to conclude. It is critical that we recognize the adverse impact that such concepts as detente and MAD have had upon the overall balance of power.

It has also become accepted logic to discount the Warsaw Pact's unquestionably superior quantitative advantages in conventional forces by arguing that such massive forces will be effectively countered and repelled as a consequence of the West's far superior technology and sophisticated weaponry. Unfortunately, preoccupation with our own technological superiority as an effective counterbalance is becoming illusory. At present, the Soviet Union has about a 10-year lead over the West in the development of particle beam weapons<sup>8</sup> and has demonstrated an anti-satellite capability.

Although Western potential for technological development remains considerably superior, it must be recognized that potential is not the same as

capability. Evidence suggests that the United States has lost its competitive edge in fielding advanced conventional weapons, and that the Warsaw Pact quantitative superiority is greatly exacerbated by the "Soviet achievement of qualitative parity in many important areas of deployed system technology."<sup>9</sup> Continued reliance upon our presumed qualitative superiority will only contribute to increased naivete on our part and, simultaneously, increased capability on that of the Soviets'.

I have attempted to provide pertinent facts that illustrate the actual balance of power as it exists now, and how and why that balance has been allowed to slip so precariously. I hope that such an assessment will contribute toward providing the desperately needed context within which an informed and truly enlightened public debate can progress. The Pastoral Letter provides an important ethical and moral contribution to the debate on nuclear arms. However, analyzing the ethical and moral content of such a profoundly important issue must not be restricted to our own concepts of virtue and religious interpretation. Attempting to provide answers of right and wrong must also be tempered with answers that are real.

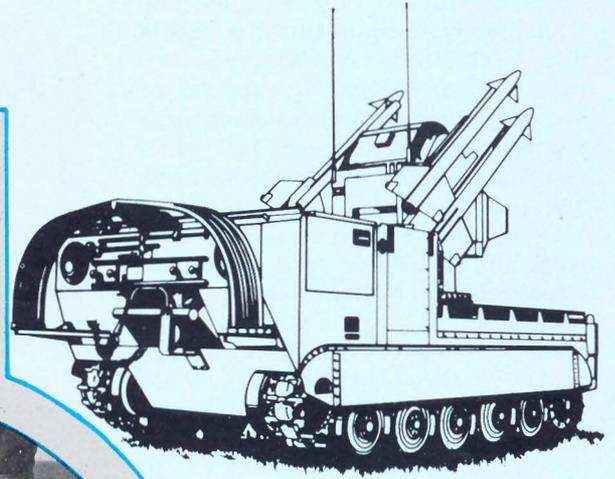
**Maj. Greg H. Parlier** is an assistant professor of operations research in the Department of Engineering at the U.S. Military Academy. He is a graduate of the Air Defense Artillery and Infantry Officer Advanced courses.

#### Notes:

- <sup>1</sup> U.S. Catholic Conference, Inc., "The Challenge of Peace: God's Promise and our Response," *Pastoral Letter of the National Conference of Catholic Bishops on War and Peace*, May 1983.
- <sup>2</sup> Elmo R. Zumwalt, Jr., "Heritage of Weakness," *National Security in the 1980's: From Weakness to Strength*, Institute for Contemporary Studies, 1980, pp. 17-25.
- <sup>3</sup> Brent Scowcroft, chairman, *Report of the President's Commission on Strategic Forces*, April 6, 1983.
- <sup>4</sup> Derek Leebaert ed., *Soviet Military Thinking*, Harvard University Center for International Affairs, 1981.
- <sup>5</sup> Joseph D. Douglass, Jr., *Soviet Military Strategy in Europe*, Pergamon Press, 1980, pp. 100-114 and pp. 172-181.
- <sup>6</sup> Steven Rosenfield, *False Science: Underestimating the Soviet Arms Buildup*, Transaction Press, 1982.
- <sup>7</sup> Albert Wohlstetter, *Legends of the Strategic Arms Race*, U.S. Strategic Studies Institute, 1975, pp. 33-47.
- <sup>8</sup> David Baker, *The Shape of Wars to Come*, Stein and Day, 1982.
- <sup>9</sup> Benjamin F. Schemmer, "Soviet Technological Parity in Europe Undermines NATO's Flexible Response Strategy," *Armed Forces Journal*, May 1984, pp. 80-95.

# From Duster to Chaparral

by Maj. Jack R. Fox



**T**hree years ago, four M-42 "Duster" battalions and one air defense artillery brigade headquarters made up the total air defense artillery structure of the New Mexico Army National Guard. Today, a massive reorganization is rearming the New Mexico Guard's air defense artillery units with modern weapon systems and transforming them into a force that can contend successfully on the air-land battlefield.

The reorganization features an ongoing transition from antiquated Duster gun systems to Chaparral, Hawk and Roland missile systems. The reorganization will also provide a new command structure, produce new unit affiliations, redesign battalion bound-

dary lines, create new units and require the construction of new armories. The final parameters of the reorganization are still being defined, but much progress has already been made. The highlights include the following:

- The 5th Battalion, 200th Air Defense Artillery, New Mexico Army National Guard, became the Army's first Roland unit in July 1983 and successfully completed its initial operational capability test last December.

- The Guard's first Hawk battalion, the 7th Battalion, 200th Air Defense Artillery, New Mexico Army National

Guard, is being formed at Albuquerque, N.M.

- Alpha Battery, 1st Battalion, 200th Air Defense Artillery, Roswell, N.M., became the Guard's first Chaparral battery in 1983 and expects to receive its initial operational capability validation this year. The rest of the battalion is receiving Chaparrals and will soon become the Guard's first pure Chaparral battalion.

- The 4th Battalion, 200th Air Defense Artillery, Tucumcari, N.M., is receiving its first battery of Chaparrals.

The New Mexico National Guard may eventually boast as many as five Chaparral battalions. The transition to new weapon systems will spread to other states (Florida, Ohio, South Carolina and Virginia) where the National Guard has air defense artillery units. Under the Army of Excellence proposals, the National Guard may eventually field as many as 23 air defense artillery battalions. That's 14 battalions more than existed in the entire Guard defense structure in January 1984.

## Meeting the Transition Challenge

While most air defenders have a warm place in their hearts for the Duster, they realize that time has passed it by, and that the Guard needs newer

weapon systems to meet the threat posed by Warsaw Pact aviation. The transition from a gun unit to a missile unit isn't all that easy. A unit receiving new weapon systems is expected to become combat-ready in less than three years, a challenging schedule when one considers that the typical guardsman is allotted only 38 training days a year. It takes careful planning, hard work and dedication from that most important of all National Guard assets, the soldier. It may help units yet to make the transition to study the steps that were taken to get A Battery, 1/200 ADA, to its present stage of training and to prepare the 1st and 4th battalions of the 200th ADA to become Chaparral units.

When Alpha Battery was selected to become the Guard's first Chaparral unit in fall 1983, the staffs of the New Mexico Army National Guard Headquarters, Sante Fe, N.M., the 111th ADA Brigade, Albuquerque, and the 1st Battalion, 200th ADA, met to identify transition milestones.

One of the first steps was to obtain a Chaparral System Crewman (MOS 16P) program of instruction and other pertinent training material from the U.S. Army Air Defense Artillery School at Fort Bliss, Texas. Next, the 1st Battalion staff identified MOSs that exist in both Duster and Chaparral batteries. These MOSs would require no additional training, and guardsmen possessing the MOS qualifications could be transferred directly into the new unit. During the MOS screening, it was determined that the primary training emphasis should be placed on the 16P MOS, the Chaparral System Mechanic (24N) MOS and other related maintenance positions.

In December 1983, before the receipt of the first Chaparral systems, all 1st Battalion staff officers, battery officers and battery non-commissioned officers enrolled in Chaparral correspondence courses offered by the Air Defense Artillery School. Twelve NCOs from Alpha Battery were selected from a group of volunteers as training cadre for the new unit.

These 12 NCOs, who would later be referred to as the "Dirty Dozen," dedicated themselves to becoming 16P qualified. Using training extension course tapes, field manuals and technical manuals, these individuals trained in 16P subjects every weekend and on selected weeknights through January 1984. In February of that year, the Dirty Dozen went to Fort Bliss for an intensified 16P course conducted by



National Guardsmen of A Battery, 1/200 ADA, line their newly acquired Chaparrals up for inspection at the Roswell, N.M., armory.

the Air Defense Artillery School. The highlight of the training came on March 6 when Alpha Battery's SSgt. David Noriega became the first National Guardsman to fire a Chaparral missile. The missile scored a direct hit on a ballistic aerial target, bringing cheers from the spectators.

As the Dirty Dozen trained, personnel from the New Mexico Army National Guard's Directorate of Plans and Training and the 1st Battalion's S-3 section finalized training plans and briefed representatives from the U.S. Army Missile Command, Redstone Arsenal, Ala., and the Air Defense Artillery School. It was decided that the Air Defense Artillery School would train new 24N recruits and other personnel with technical MOSs. New recruits enlisting in the Guard to become Chaparral crewmen would attend initial-entry training at Fort Bliss, just as the guardsmen recruited to become Duster crew members had done in the past, but the Guard would conduct its own transition training for existing personnel at their home stations. This decision placed emphasis on one of the Guard's traditional strengths, its ability to train its own soldiers.

Alpha Battery's Dirty Dozen returned to Roswell and launched an intensified training program for the remainder of the battery. The training proceeded even though the unit would not receive its first two firing units until July, and the remaining 10 units would not arrive until late August of 1984.

In late May, Alpha Battery's first guardsmen recruited to become Chaparral system mechanics were sent to Fort Bliss. Their training was scheduled so they would graduate in August and be on hand when the battery's last 10 Chaparral firing units arrived in Roswell.

With help from Missile Command teams, the Chaparral mechanics readied the systems for the battery's annual training. The morale of Alpha Battery soldiers, as they received their new weapon systems and became the National Guard's first Chaparral battery, was sky high. The annual training, conducted that year at the New Mexico Army National Guard Military Academy near Roswell, was considered the most productive training in years.

In November, the unit conducted MOS testing of its 16P personnel and attained an exceptionally high achievement rate. This was exciting news for those involved in the program since it was the first measure of the battalion's and battery's training program.

As Alpha Battery continued its training, the remainder of the 1st Battalion, with assistance from its partnership unit, the 2nd Battalion, 5th Air Defense Artillery, Fort Hood, Texas, conducted limited Chaparral training during weekend drills. In January, the battalion, using Alpha Battery personnel and equipment, conducted a Chaparral training school at Roswell to prepare cadre for each of the battalion's other batteries.

As 1985 progressed, all 1st Battalion units continued Chaparral training. During annual training that year, the battalion, along with Charlie Battery, 4th Battalion, 200th Air Defense Artillery, conducted the first battalion-level Chaparral training in National Guard history. A highlight of the training was the firing by Alpha Battery of four Chaparral missiles. The battery scored three kills.

The New Mexico Army National Guard Headquarters, meanwhile, stayed busy planning for the future. With the transition from Dusters to Chaparrals will come changes in personnel strength and requirements for training areas and facilities. A force integration section has been formed to help create a highly trained and specialized air defense artillery unit ready to meet any contingency.

The New Mexico Army National Guard and the four National Guard air defense artillery states stand ready to meet challenges presented by the acquisition of new weapon systems. Now, just as it has been throughout our history, the citizen-soldier is prepared for any mission at any time. All the National Guardsman seeks is the opportunity to prove what he can do.

Maj. Jack Fox is chief of the New Mexico Army National Guard's Training Branch.

# School Emphasizes Communicative Skills



**S**oldiers enrolled in Officer Basic and Advanced courses last summer found the curriculum expanded to include more practical writing exercises and refresher lessons on grammar. The same type of changes are in store for warrant officer, non-commissioned officer and ROTC courses.

The emphasis on communication skills is a result of feedback from unit commanders, said Shirley Thomas, an education specialist with the Officer Training Directorate, Office of the Deputy Chief of Staff for Training, U.S. Army Training and Doctrine Command, Fort Monroe, Va. "Army leaders, like their civilian counterparts, must develop effective communication skills to be successful in their jobs," she said.

In 1984, Vice Chief of Staff of the Army Gen. Maxwell Thurman tasked the U.S. Military Academy to develop a four-hour executive writing course. The course was sent to several units and training posts for review and testing. Feedback indicated that a more intensive approach to teaching writing skills was needed.

The Army Writing Program was approved in late 1984 and an Army Writing Office was established at TRADOC to manage the program. The effort is now institutionalized with the publication of AR 600-70, The Army Writing Program, dated April 5, 1985.

"This will be a phased program," Thomas said. "OBC and OAC were adjusted this summer with lesson plans developed by the Military Academy. Next, we'll look at NCO courses. Some courses already teach writing. But now there'll be a greater emphasis and more actual writing exercises."

The new courseware was introduced in July 1985. Officer Basic and Advanced courses now include 16 hours of communicative skills. Warrant officer, non-commissioned officer and ROTC courses are to be adjusted by 1987 to include writing and oral communications.

## **ADA Communicative Skills Office**

The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has established a Communicative Skills Office to administer the Army Writing Program at Fort Bliss. The office's charter expands the scope of the program to include military and civilian

writers and editors who produce doctrinal and training literature. All communicative skills — reading, listening and speaking as well as writing — will be taught.

Fort Bliss writers and editors who have not completed the TRADOC common core program of instruction taught in Officer Basic and Advanced courses will be required to complete a modified common-core course. The modification will include tracks specifically designed for doctrinal and training literature writers.

The Communicative Skills Office will also develop on-site remedial courses for staff and faculty personnel who cannot successfully complete the program. Officer students with poor communicative skills will take the remedial course on their own time.

"Everybody in the Army — military or civilian — writes," said Communicative Skills Office Project Officer Shirlee Allen. "Some write better than others. Most write adequately. That means they get their jobs done. The problem is that, in general, Army writing is poorly done. It is verbose (wordy), obscure (unclear) and is written to impress rather than express."

Why do Army writers write so poorly? Why do they send a three-paragraph report when a three-line report would do the job? "Because everyone knows that it takes at least three paragraphs to get the report past the boss. Right? Wrong! The bosses are getting smarter," Allen said.

To illustrate her point, she produced a letter written by Maj. Gen. Donald R. Infante during his first weeks as commander of the U.S. Army Air Defense Artillery School and Fort Bliss. The letter, addressed to Fort Bliss commanders, lists basic rules of writing and composition. The new chief of Air Defense Artillery urges his subordinates to use definite, specific concrete language. "Omit needless words," he writes. "A sentence should contain no unnecessary words, a paragraph, no unnecessary sentence." He closed his letter with: "Now that you have 'my rules,' my conscience will be at ease if your message or letter is bounced. When bounced, I will refer to these rules. Warning is hereby given. Discipline in writing, as in many other things, is crucial to success."

# Electronic Warfare: The Invisible War



*This is the first in a series of articles that will explore a controversial topic — electronic warfare. Die-hard advocates consider electronic warfare as the ultimate weapon. Their interpretation is that the enemy is blind and cannot attack. The detractors consider electronic warfare to be a waste of resources because there's no ball of fire. (These detractors will change their minds when directed-energy weapons mature.)*

*Neither viewpoint is correct (of any weapon). There is only one determining factor — tactics. Tactics implies knowledge, flexibility and the imagination to innovate when things go wrong or not according to plan.*

by Tony LoPresti

The prime emphasis during World War II was on air power consisting of dive bombers; ground-strafting fighters; and high-altitude, medium and heavy bombers. The simple philosophy was that control of the air meant control of the ground.

Two conclusions to be drawn from this review are:

- Lessons learned. Nothing new. We do the exact same things today that were done during World War II.

- Electronic warfare in conjunction with tactics covers a wide range of activities. You may not think that electronic warfare is the lighting of a bonfire, but in tactics it is.

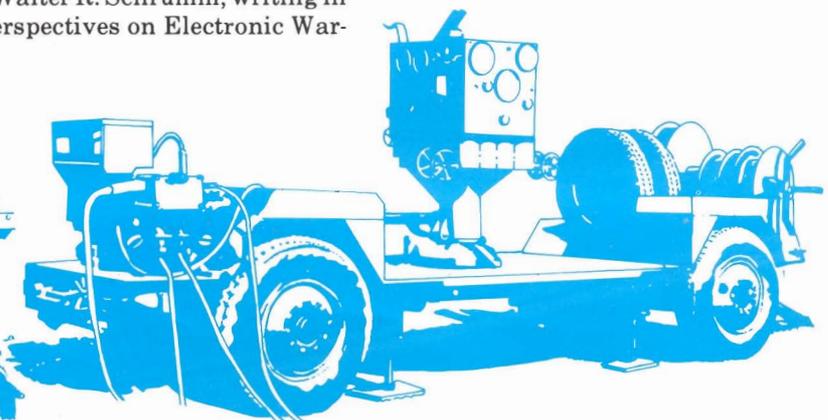
Electronic warfare encompasses three major components: electronic support measures (ESM) — actions taken to intercept, identify and locate enemy transmitters; electronic countermeasures (ECM) — actions taken to disrupt and deceive enemy sensors; and electronic counter-countermeasures (ECCM) — actions taken to counter enemy electronic countermeasures.

Capt. Walter R. Schrumm, writing in "New Perspectives on Electronic War-

fare Defense," *Army Communicator*, Winter 1985, developed the following chart to show the relationship of ESM, ECM and ECCM. Although communications related, it is also satisfactory of Air Defense Artillery.

	DEFENSIVE	OFFENSIVE
ACTIVE	Electronic counter-countermeasures (ECCM)	Electronic counter-measures (ECM) Jamming Imitative Communications Deception (ICD)
PASSIVE*	Signal security (SIGSEC) COMSEC ELSEC	Electronic support measures (ESM) -- unit, freqs -- -- location -- Signal Intelligence (SIGINT) COMINT ELINT TELINT

\* Another approach to labeling the active/passive dimension would be to define it as active/supporting, since both SIGSEC and ESM are supporting measures to ECCM and ECM, respectively.



Our principal electronic warfare interest focuses on combating the Soviet radio-electronic combat. The goal of radio-electronic combat is to destroy or disrupt at least 50 percent of enemy weapon systems' command, control and communications, either by jamming or destructive fires. Radio-electronic combat is intended to disrupt the enemy's

*There is great satisfaction in watching a magnificent, megabuck, sophisticated weapon system rendered totally useless by an invisible jamming signal.*

critical time phasing to the extent that perishable data is destroyed, thereby negating effective decision making. Use of military electronics has given birth to an entirely unique concept of warfare; namely, countering the threat without violence. Electronic warfare is used to blind, detect, inhibit, decoy or deceive the enemy or his weapon systems. There is great satisfaction in watching a magnificent, megabuck, sophisticated weapon system rendered totally useless by an invisible jamming signal.

### Origin

Electronic warfare can be traced as far back as 1916 when Sir Henry Jackson repositioned the British war fleet against the German war fleet at the battle of Jutland. Slight changes in direction of arrival of German radio signals gave Sir Henry a clue to the German fleet maneuvers. Thus, Sir Henry, on the basis of this ESM, was able to counter the German fleet's maneuver.

World War II saw the rapid evolution of electronic warfare. The real electronic warfare emphasis was and continues to be against ground air defense. It is estimated that use of ECM during World War II saved 450 U.S. bombers and 4,500 airmen from German radar-controlled anti-aircraft artillery flak. This was a tremendous personnel and aircraft savings when considering that the first U.S. jammer was not developed until early 1943. The British maintained electronic warfare as a covert operation in early World War II so as not to reveal their actual capabilities. Prime Minister Winston Churchill referred to this electronic warfare combat as "The Wizard War." The British, faced with great numbers of sophisticated German bombers, extensively used electronic warfare to reduce the

Luftwaffe's effectiveness during the bombing of Britain.

### Battle of the Beams

One example of this sophistication was the first German bomber navigation aid known as "Lorenz." This aid used the radio frequency beams of public radio stations to navigate the bombers over their targets. The British countered with "Meaconing" (use of masking beacons) which distorted the direction from which these radio navigation beams were coming.

The British and Germans subsequently embarked on a series of countermeasures and counter-countermeasures referred to as radio countermeasures. Churchill called this era the "Battle of the Beams."

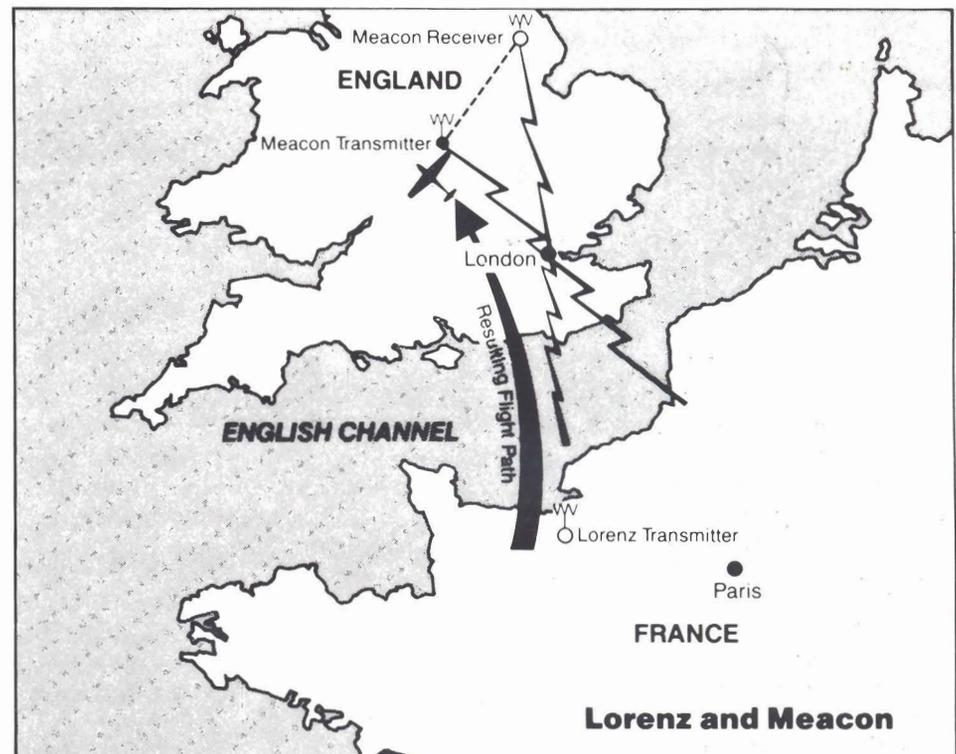
When it became obvious to the Germans that Lorenz was being effectively countered, they switched to a new system of multiple radio beams. This new system had two radio beams, one transmitting dots and the other transmitting dashes. The bombers flew between the radio beams of dots and dashes which resulted in a solid radio tone heard by the navigator. This system had an azimuth accuracy of 800 yards over target. The German system *Knickebein* was called "Headache" by the British and naturally the countermeasure was "Aspirin." Aspirin "bent" the Headache beams, resulting in few bombs reaching their targets.

A story is told that while Headache was being dosed with Aspirin, no one had the courage to tell Field Marshal

Goring that the navigation beams were being "twisted." Just as we experience today, the "ivory tower" folks kept telling the combatants that the beams were infallible, and that any doubters would be eliminated. The German air crews suspected that the signals were being affected by countermeasures but, naturally enough, did not wish to jeopardize their officer or enlisted efficiency reports by revealing what was happening to their bombing efforts.

The Germans then countered with "Ruffian," an omni-directional, 24-hour propaganda radio broadcast. The radio transmission beam went from omni to highly directional just prior to an air raid. This beam, crossed by another transmitted beam, told the bombardiers that they were over their target. British civilians contributed to the development of a countermeasure when they reported that the propaganda broadcasts became louder (in the vicinity of the directional beam) or faded away (when the transmission was no longer omni). This created early warning of an impending attack and the approximate location of the target.

The British countermeasure, "Bromide," retransmitted the propaganda broadcast with an omni-directional antenna when the German station narrowed its beam. Sometimes the British also transmitted narrow beams which crossed the original German beam over the English Channel, prompting many bombardiers to release their bombs into the water.

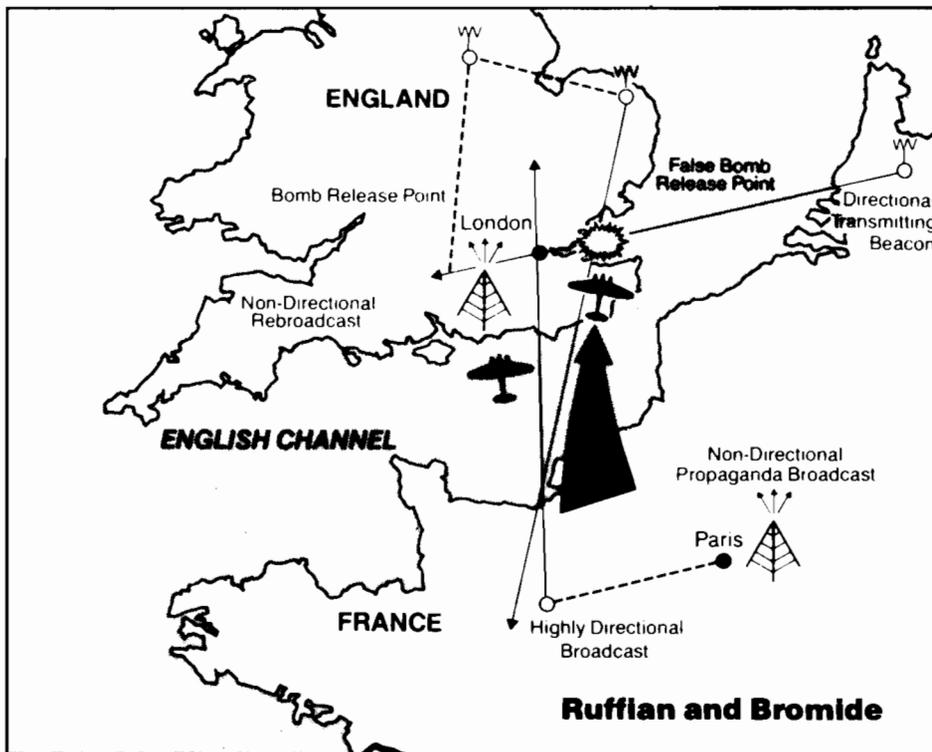
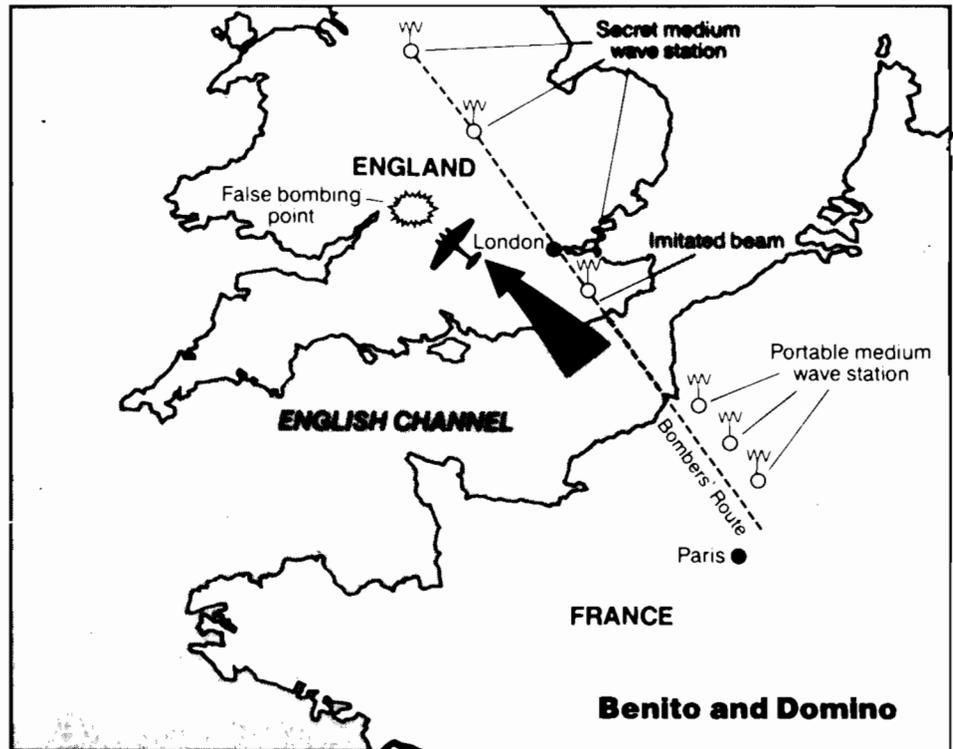


When considering that Hitler's plan was to bomb England into submission, one can imagine the distress and frustration the Germans were experiencing at this point.

### Lighting Bonfires

The next effort by the Germans was to equip one squadron, the "Kampf Gruppe 100," with all available navigational aids. The mission of KG-100 was to get on target and drop incendiary bombs to visually direct the follow-on bombers. Their tactic was to alternate navigation systems so that as the British countered one technique, the German air crew would switch to another. The British countermeasure was "Starfish" which consisted of decoy fires. After the KG-100 squadron had dropped its incendiaries, large numbers of bonfires (Starfish) were ignited in open spaces in the vicinity of the target, resulting in a wide dispersal of the bomb load.

The Germans, correctly assuming



that the British would not be monitoring frequency-modulated (FM) radio waves, devised "Benito." This technique involved agents, using portable FM transmitters along the bombing route, who talked the pilots over their target.

By now you should have guessed that the countermeasure "Domino" was to intercept and provide false orders to the German bombers. Some pilots became so disoriented by the results of this technique that they were

forced to land in England. Domino, however, did not always produce the desired results. It is suspected that Dublin was unintentionally bombed one night when the bombers were decoyed from another target.

In November 1941 the British decided to jam German tank communications during the Libyan Campaign. Airborne jammers were used to prevent inter-tank communication. One needs no special talent to figure out the mess that the German tanks got into. But,

the Germans were clever in their countermeasure. They sent fighters after the unprotected airborne jammers and quickly ended that mess.

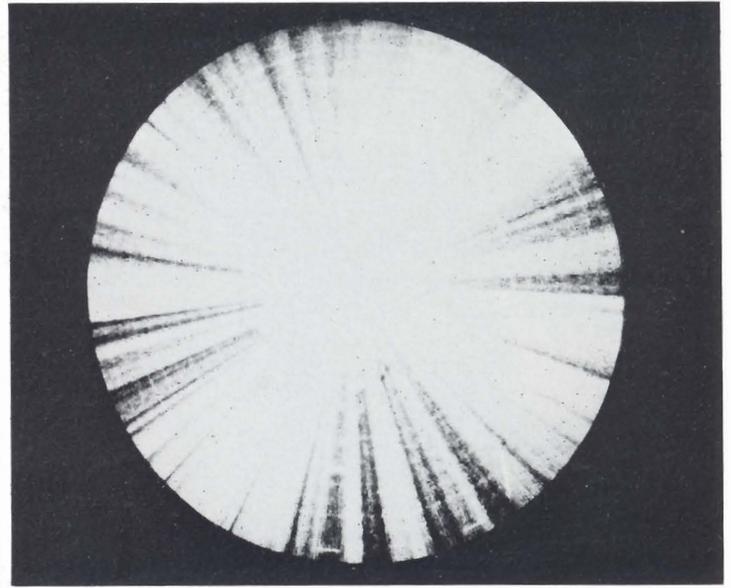
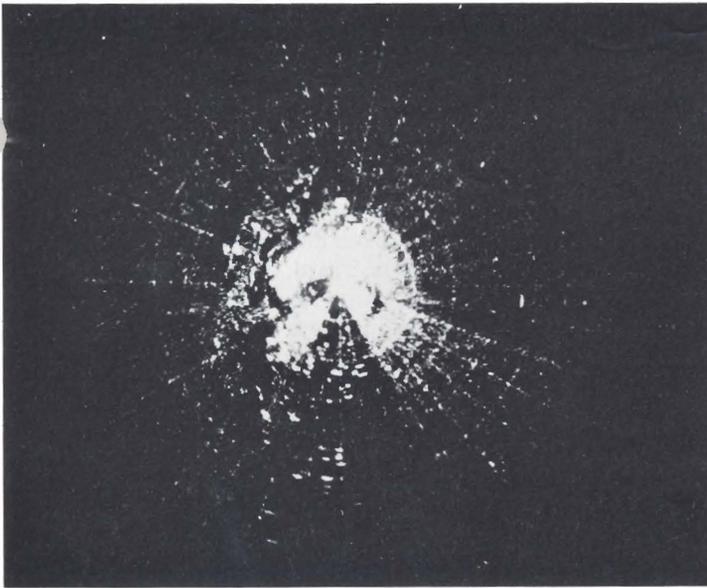
### Stealing Ships

About this time, the British were having trouble moving shipping through the English Channel because of accurate fire from German radar-controlled guns. As a countermeasure, the British built ground-based jammers against the radars and effectively prevented them from detecting their ships.

The Germans, not to be outdone, jammed the British coastal radars and moved the vessel *Schornhorst* from Brest to the north via the English Channel. One quirk in this whole affair was that one radar was not jammed and reported the activity. Unfortunately, nobody believed the British operators when they reported that a target was detected and moving through the channel.

Radar jamming had come of age. In fact, the Germans liked it so well that Allied naval radars were jammed from the time they entered the Mediterranean area until they left. The Allied ships were passed from one German coastal countermeasure group to the next, thus constantly jamming ships' radars.

The Germans also did other shenanigans that probably had them snickering for weeks. On one occasion they took control of several U.S. Navy radio-controlled boats and ran them in tight



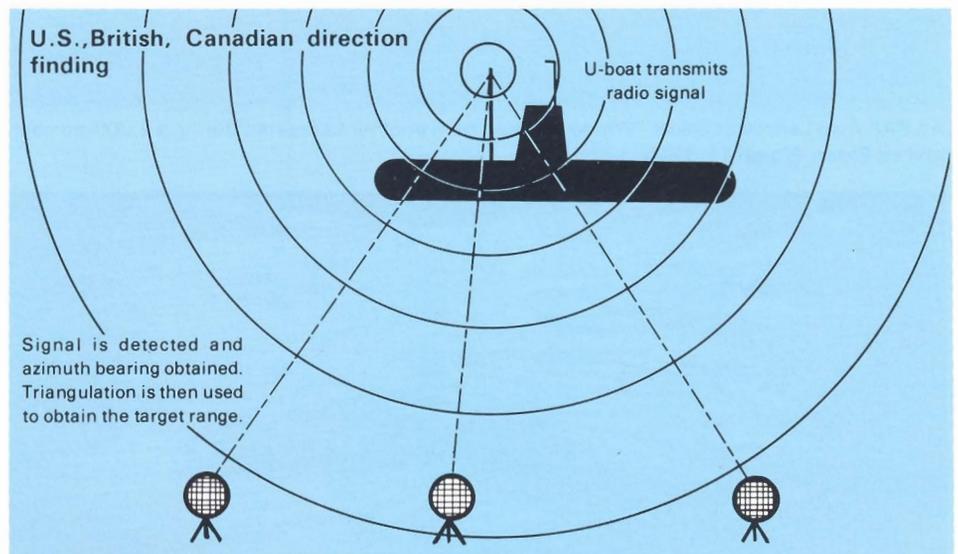
The radarscope at the left shows many target echoes. At the right is the same radarscope being jammed.

circles until their fuel was exhausted. This action was slightly disheartening for the Navy guys, and the United States began to really take notice of the potential that electronic warfare could provide. The United States was carefully monitoring the ongoing electronic warfare between the British and the Germans. By 1941 several service organizations were investigating electronic warfare, and the first U.S. jammer was produced in 1943.

Radar was now recognized as a valuable weapon. However, concern arose about how to neutralize enemy radars and prevent him from doing the same to our developing radar systems. A parallel effort was initiated that would simultaneously develop ECM against enemy radars and ECCM for U.S. radars.

In July 1941, the president issued orders for the U.S. Navy to destroy the German U-boat "Wolf Packs" which were operating in the Western Atlantic and were devastating Allied shipping. The Germans had developed an excellent C<sup>3</sup> system for the U-boats based on high-frequency communication. As a counter, the U.S. Navy developed a network of shore and ship direction-finding systems to detect the U-boats radio transmissions and triangulate their whereabouts. Great Britain and Canada, in conjunction with the United States, also developed a direction-finding network system. Through this technique, the Allies effectively countered the "Wolf Pack" tactics even though the Germans went to a form of highly sophisticated "burst" transmissions.

In the meantime, the Polish had stolen a German encrypting machine



and had given it to the British. Between being able to decode the mission orders and direction-finding transmissions, the Allies effectively checked the "Wolf Packs."

*The British claimed that two months' use of chaff as a countermeasure saved at least 200 aircraft and between 1,200 and 1,500 combatants.*

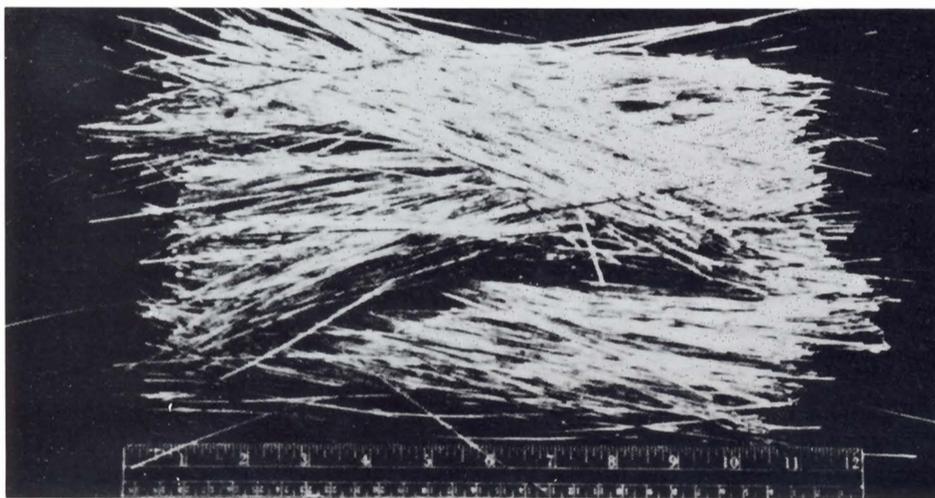
The clever and innovative Germans were undaunted. Their scientists, working feverishly to counter Allied activities, developed the HS-293 RF-guided glide bomb, which subsequently sank the British ship *Warsprite*; the Italian battleship *Roma*, which was attempting to link up with Allies; and

damaged the U.S. cruiser *Savannah*. The HS-293 glide bomb was an effective anti-ship weapon. The Allies had difficulty countering it because they could not detect some of the control signals which were above the frequency range of World War II intercept systems. Once a jammer was developed and fielded, no major ship was sunk by HS-293 glide bombs.

Behind the great battle of wits between Allied and German scientists for supremacy in the operational use of radio-frequency energy is a remarkable story of actions and counteractions. These activities were designed to jam and confuse the enemy's radio communication and radar warning systems, hoping to create a chaotic muddle in enemy intelligence. Some of the exotic code names in the radio countermeasure war were "Mandrel," "Grocer," "Boozer," "Tinsel," "Ground



An RAF Avro Lancaster ejects "Window," seen from another Lancaster, during a 1,000-bomber raid on Essen, March 11, 1945.



Tin-foil strips, "Window," being ejected in the air to jam and deceive enemy radars.

Cigar," "Airborne Cigar" and "Window." Window is chaff, which is still used today against air defense weapons. During the raid on Hamburg on the night of July 24, 1943, 791 bombers dropped 20 tons (over 2½ million strips) of chaff that gave the Germans the impression that 12,000 aircraft were overhead. When the Germans used chaff as a countermeasure on Sept. 6, 1943, the Allies reported in excess of 200 German bombers over Bizerte when in reality there were only 50. The British claimed that two months' use of chaff as a countermeasure saved at least 200 aircraft and between 1,200 and 1,500 combatants.

The first self-screening jammers

were B-17s equipped with spot jammers. These jammers became imperative because the Germans had developed excellent search and anti-aircraft artillery gun laying radars.

The Allied "tactical" use of ECM was based on a well conceived operational procedure. First, it was necessary to determine where the anti-aircraft radars were located. This was done by special reconnaissance aircraft known as ferrets. These aircraft, known today as recce aircraft, functioned similarly as do today's reconnaissance aircraft. Their specific job was to "ferret out" any and all possible information about electronic activity in a given area of operation. Second, the data was eval-

uated and collated with other intelligence. This was a form of double checking their intelligence information. Radar coverage charts that showed the actual visibility coverage of the enemy radar network were drawn. These radar coverage charts, developed by Army Air Corps personnel, were similar to our current clutter and coverage charts. Third, the charts, again in conjunction with other intelligence information, were then used to plan the ECM tactics. Fourth, bombers were fitted with jamming transmitters ("Carpet") and chaff ("Window").

It becomes apparent that extensive coordination goes into an ECM attack mission. The reason for such extensive coordination and planning is that any violation of the ECM principles results in the aircraft being destroyed. This was dramatically demonstrated in the B-52 raids during the Southeast Asia conflict. Certain tactical electronic warfare precepts were violated, and aircraft were lost to enemy air defense missiles. There is no forgiveness for violation of these "rules of war."

In summary, we have observed that:

- Electronic warfare has been around for quite some time.
- Tactics, as in any aspect of war, are most important in countering a countermeasure. This means that a well-trained soldier with a good dose of American ingenuity can usually defeat the action of a predictable machine.
- Electronic warfare encompasses more than just bouncing around a bunch of electrons. Fool the enemy. Cause him to make deadly mistakes.
- Electronic countermeasures are used to blind, detect, inhibit, decoy or deceive the enemy and his weapon systems. Electronic counter-countermeasures are used to overcome ECM.

The important factor is tactics, not flipping a switch. As seen above, many different tactics were used by the Allies to defeat German electronic warfare. Understanding what the enemy was doing and countering the action was the critical ingredient. In the next issue we will look at some tactics used against ground air defense.

*The author extends his appreciation to Harry F. Smith and to the 3537th Electronic Warfare Squadron, 3535th Navigator Training Wing (ATC), Mather Air Force Base, Calif.*

*Tony LoPresti is chief of the Tactical Air Defense Branch, Concepts and Studies Division, Directorate of Combat Developments, Fort Bliss, Texas.*

VIDEBEMUS

**AIR DEFENSE  
ARTILLERY**



Computer generated imagery simulates aircraft and terrain in the manned simulator.

by Frank Schoch

**S**hort-range air defense (SHORAD) weapons' crews must make important decisions in their air-land battlefield roles, yet the help they receive during the decision-making process is scanty. In semi-isolation and with meager incoming information, they are expected to single-handedly defend a unit's airspace and at the same time ensure the safety of friendly aircraft.

While improvements have been made that extend SHORAD weapons' engagement ranges and increase their lethality, only minor technological advances have been made to help the SHORAD crews acquire and identify aircraft. These crews continue to operate under rules of engagement that allow them to fire only when they have visually identified an aircraft as foe. Consequently, if they err in identification for whatever reason — mistaken identity, poor visibility, or hasty judgment brought on by the heat of battle — and engage the aircraft, the probability is high that they could unintentionally destroy a friend. The most disastrous result, of course, would be the possible loss of a friendly pilot, one whose aircraft might have been a cru-

cial factor in winning the battle. It would also be costly, as well as unfortunate, since modern aircraft costs run in the millions of dollars.

Realizing the consequences of inadvertent destruction of friendly aircraft, the Office of the Under Secretary of Defense for Research and Engineering chartered the Joint Forward Area Air Defense (JFAAD) Joint Test Force in December 1981 to evaluate methods of improving the effectiveness of all SHORAD weapons which operate on the forward edge of the battlefield. Inherent in this tasking is the reduction of friendly air casualties from friendly fires. After extensive planning, researching and coordinating with U.S. armed services in Europe, JFAAD recently received approval of test design plans that will allow the joint test force to construct a multimillion dollar test facility at Fort Bliss,

# A Test Design to Improve SHORAD

Texas, and proceed to the next phase of testing. The test is scheduled to be completed in 1988.

## Issues

The joint test will address three major issues: aircraft identification; projected command, control, communications and intelligence (C<sup>3</sup>I) capabilities; and airspace management. The issues, which are the major areas of concern the test has to address to achieve its purpose, are:

*How can collective means of aircraft identification be used in support of forward-area air defense?*

Two means of aircraft identification will be investigated, the direct and indirect techniques. Direct identification is the current visual and electronic identification used by SHORAD units. Indirect identification is the identification of aircraft using information gathered by other elements and relayed to SHORAD units through communication systems.

*How do projected C<sup>3</sup>I capabilities support forward-area air defense employment?*

The architecture of three proposed C<sup>3</sup>I systems will be analyzed. The systems are the enhanced manual SHORAD control, the objective SHORAD C<sup>2</sup>, and the still-to-be-developed excursion SHORAD C<sup>3</sup>I.

*How do airspace management procedures affect the mission accomplishment of SHORAD systems and friendly aircraft?*

## Test Designs

A pattern of analysis detailing the methods to be used to obtain data

results has been developed for each issue. The framework for the JFAAD analytical approach is the fire unit engagement cycle. Figure 1 represents a typical sequence of events that the fire unit performs to conduct aircraft engagements.

The measures of effectiveness will be determined by measuring the ratio of friendly versus hostile aircraft killed by forward-area air defense. The effectiveness of the system under test can then be determined, and the questions asked in each issue can be answered. The specific ratio is the percentage of hostile aircraft killed versus the percentage of friendly aircraft killed.

A data management approach will also be used during the test to ensure that correct data is collected from the various sources, that the data is reduced to a usable form and that the data is stored for later retrieval and analysis.

#### Tactical Context

The JFAAD staff will publish two scenarios and a threat description to support the test design. These documents will supply details necessary to develop the testbed.

The first scenario will focus on the air-land battle in the European theater of operations, specifically the 3rd Armored Division, V Corps area. The U.S. ground forces will be organized in accordance with the Army of Excellence force structures, while the U.S. and NATO air forces will follow current modernization plans.

The second scenario will focus on one of the U.S. divisions with a contingency mission for Southwest Asia. The force deployed for this scenario will be organized in accordance with the Army of Excellence and Air Force, Marine Corps and Navy modernization plans.

The JFAAD threat description was developed to address the specific potential threat to forward-area air defense systems and the general threat to NATO forces in the Western theater of operations. Soviet and Warsaw Pact forces, systems and structure are those projected for 1992. Specifically, these documents provide:

- a definition of forces, air defense systems, SHORAD C<sup>3</sup>I systems, joint C<sup>2</sup> nodes, deployments, doctrine and tactics, threat levels and air defense priorities under test.

- a definition of threat aircraft characteristics, flight profiles, armament loading, missions, tactics and procedures, and any other threat systems that impact on the forward-area air defense weapon systems under test.

- a definition of friendly Army and Air Force aircraft characteristics, flight profiles, missions, tactics and procedures, including supplemental fire control measures that impact on the weapon systems under test.

- a provision for the tactical context for all test events to be evaluated by field testing, manned simulation and computer modeling.

#### Testbed

Three major methodologies have been integrated into the JFAAD testbed: computer modeling, manned simulations and field testing. These methodologies will be interactive.

To accommodate JFAAD's test design, a test facility composed of five separate but integrated systems has been proposed by a defense con-

tractor. They are an enhanced, realistic air defense engagement system; small-scale field testing system; a weapons system manned simulator system (WSMSS); a command post/manned simulator system (CPMSS); a JFAAD computer model system; and a central data system (CDS).

The WSMSS will simulate SHORAD crew firing situations in an open- and closed-turret system. In the open-turret system, the crew leader is stationed outside while the gunner operates the system. In the closed-turret system, both the crew leader and the gunner are stationed inside the vehicle. The CPMSS will simulate the division airspace management element, air battle management operations center, a battery command post, and a platoon command post.

The CDS will consist of a data base management system; testbed data bases; scenario generation tools; test data reduction tools; test data analysis modeling tools; data aggregation and statistical analysis tools; and system communications, control and management.

The actual testing will be a coordinated effort between JFAAD (a work force of Department of Defense civilians, Army and Air Force personnel) and different Army and Air Force organizations around the world, including the Identification Friend, Foe, Neutral Joint Test Force, an Air Force-led joint test based at Kirtland Air Force Base, Albuquerque, N.M. (see "Friend, Foe or Neutral?" *Air Defense Artillery*, Fall 1985). Additionally, JFAAD personnel have been making and will continue to make observations in major field exercises funded by other defense agencies to gather data that may be useful during the test. In the past, JFAAD has participated in the Border Star exercise held in the Fort Bliss area during March 1985, and two Central Enterprise exercises held in Germany in June 1984 and 1985.

#### Test Results

Collected and analyzed test data will be documented in interim and final reports that will be distributed to air defense artillery-related organizations. The data should identify joint tactical, doctrinal, procedural and materiel changes that not only increase SHORAD systems' effectiveness, but also reduce friendly aircraft destruction risks.

Frank Schoch is a technical publications editor with the Joint Forward Area Air Defense Joint Test Force located at Fort Bliss, Texas.

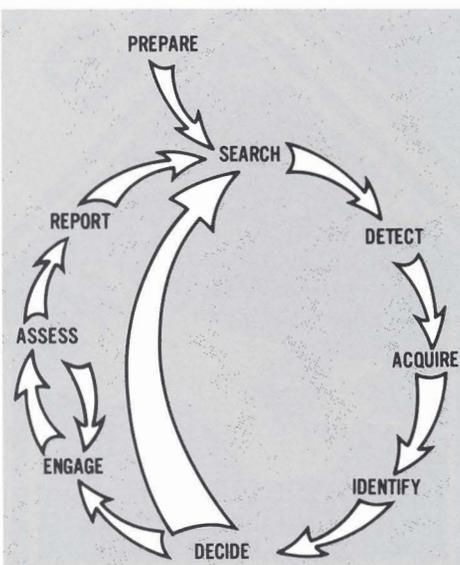


Figure 1. Fire Unit Engagement Cycle

Once the fire unit is prepared to conduct its air defense mission, it begins its engagement cycle by searching the adjacent airspace and concentrating on any assigned search sectors. Once a potential target is detected, the fire unit tries to acquire the target by radar acquisition and tracking or visual tracking so that the potential target can be identified. The fire unit leader then decides whether or not to engage the aircraft, basing his decision on what he perceives the aircraft's identification to be, the rules of engagement in effect and any other pertinent command and control information. If he decides not to engage, the fire unit breaks track and returns to searching for another target. Search time may be negligible if another target previously had been detected for evaluation. If the decision is to engage, the fire unit performs the required engagement sequence, assesses the results of the engagement, re-engages if necessary and reports on the results as required.

A rapid deployment force unit must be constantly prepared to move and fight anywhere, anytime. As a member of a rapid deployment force, the 5th Battalion, 52nd Air Defense Artillery, Fort Stewart, Ga., needed an intense, incoming-soldier indoctrination program to maintain consistent readiness in a unit that experiences a 10-percent turnover each month.

Many soldiers arriving at the battalion are fresh from advanced individual training at Fort Bliss, Texas; others are returning from overseas duty tours. They may be single or married. Usually one or two non-commissioned officers, perhaps with leadership experience, also arrive. Their backgrounds are as diverse as any group in an air defense artillery battalion.

The Air Defense Indoctrination Program (ADIP) was started by Lt. Col. E.

Paul Semmens, battalion commander, who needed soldiers prepared for possible immediate deployment. The two-week program is designed to in-process soldiers, privates through staff sergeants, as swiftly and efficiently as possible, and to teach them battalion procedures at the same time.

On the first day of ADIP, there is always an orientation address by the battalion commander and command sergeant major. Semmens thinks it is essential to make the soldier understand the reasons for the course from the start. "I want ADIP to be a significant emotional event, somewhat like basic training," he said. "I want those guys to leave ADIP feeling, 'I've joined a tough outfit, and I see I've got a lot to learn,' but still feeling good about having 'earned a place' in the battalion by passing this course."

Semmens had the chance to see a similar program in action, the Ranger Indoctrination Program, while serving as the deputy installation commander at Hunter Army Airfield, Savannah, Ga. When he became commander of the 5/52 ADA, he wanted to adapt elements of that program into one tailored for an air defense artillery battalion.

The battalion commander noted that teaching battalion standards in a disciplined environment, and at the same time building a sense of unity among the soldiers in each class, requires special skills of the non-commissioned officers who must run the course.

"We look for a commandant who is outstanding in every way," Semmens said, "preferably with a drill sergeant background. I want a firm but fair standard maintained." Of great importance, he thinks, is a commandant's ability to lead by example, setting the standards and adhering to them. He is also considering a policy of rotating the commandant position every six months so the soldier isn't serving outside his primary MOS too long.

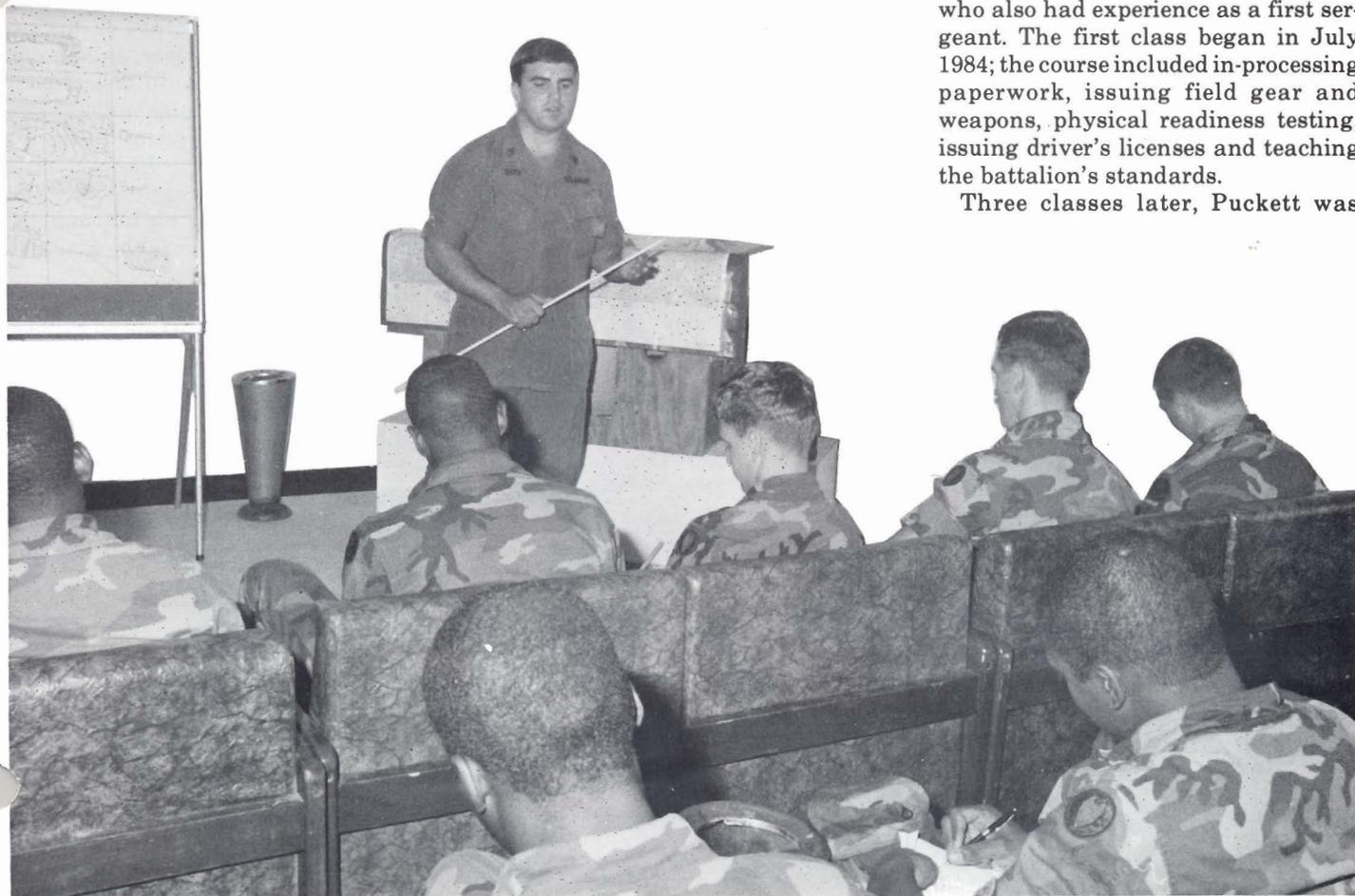
The task of putting the program together and finding NCOs to run it was given to Command Sergeant Major Jimmy K. Williams. He chose an ex-drill instructor, SFC Homer Puckett, who also had experience as a first sergeant. The first class began in July 1984; the course included in-processing paperwork, issuing field gear and weapons, physical readiness testing, issuing driver's licenses and teaching the battalion's standards.

Three classes later, Puckett was

# ADA Indoctrination

by Elizabeth Carlson

**Soldiers 'earn' their place in the 5th Battalion, 52nd Air Defense Artillery, through a rigorous two-week in-processing program**



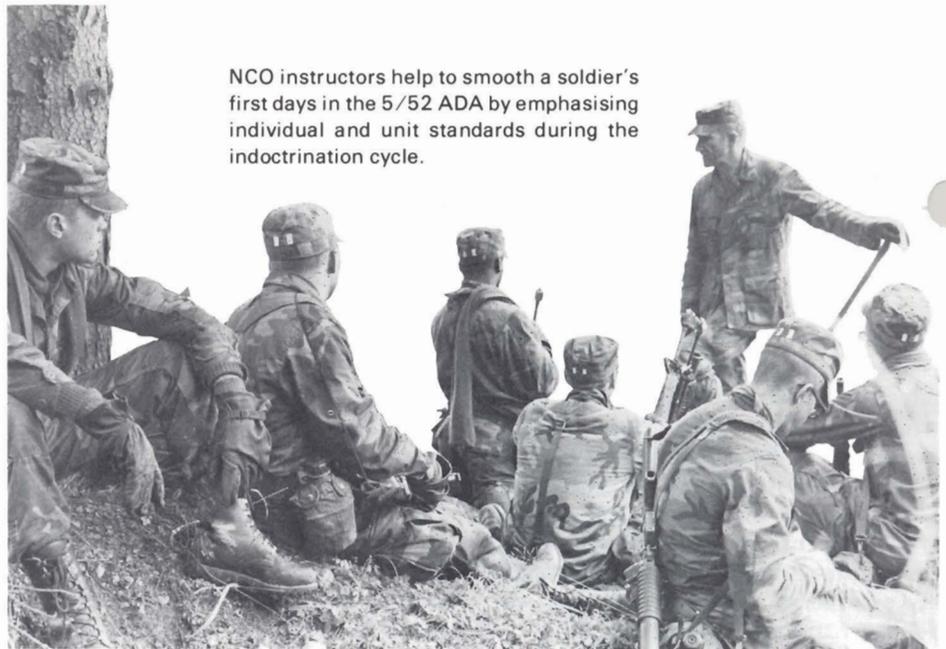
needed to fill a platoon-sergeant opening in B Battery, and SSgt. Philip Maddox was given the job of running ADIP. He was asked to add to ADIP's schedule all the classes and briefings that were yearly requirements in the battalion. These were the standards of conduct briefing; a nuclear, biological and chemical class; barracks standard operating procedure; crime prevention; weapons qualification; and a reenlistment briefing. Eventually an Army Training and Evaluation Program (ARTEP) briefing and dental exam were added to the list of activities.

Maddox compiled the "ADIP Instruction Booklet" while he ran the program, and this booklet has become the backbone of instructors' references. The booklet states the guidelines for all the classes, providing step-by-step preparations for the instructors.

Currently, an ADIP class begins every other Monday morning. The classes range from nine to 30 soldiers who are divided into squads, with newly assigned sergeants as squad leaders.

The process begins with early-morning physical training. An initial diagnostic physical readiness test is given to help pinpoint areas that need the most work; physical training is scheduled five days a week and is extremely rigorous to help soldiers acclimatize as rapidly as possible.

During the first week of ADIP, a soldier's equipment is inventoried, and TA-50 and organizational clothing is issued. In-processing paperwork, dental examinations, explanations of division and battalion standards, and



NCO instructors help to smooth a soldier's first days in the 5/52 ADA by emphasizing individual and unit standards during the indoctrination cycle.

inspections are scheduled during the first week as well.

During the second, and final, week, the course concentrates on classroom briefings and diagnostic tests. The tests are designed to test common skills, general air defense artillery knowledge and soldiers' specific MOS knowledge.

At the end of each cycle, the soldiers are given final evaluations, and a graduation ceremony is held with an honor graduate announced. The results of all tests, records of briefings and any counseling statements a soldier receives are sent to his battery's first sergeant.

Command Sergeant Major Lowell Ingram, who replaced CSM Williams, is as deeply involved with the program

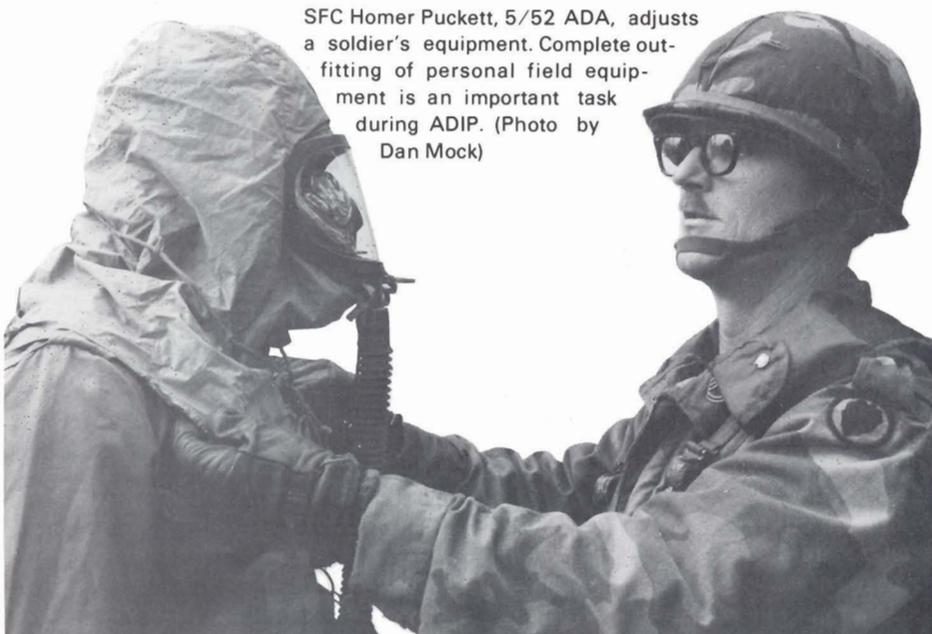
as his predecessor. Ingram feels an important part of ADIP's aim is to identify soldiers with potential attitude problems, as well as those who have difficulty operating under pressure. "Generally, a person with a bad attitude who fails ADIP won't make it in the batteries either," he said.

Other reasons for failing the course are: being cited for driving while intoxicated, a positive urinalysis, disobeying a lawful order or being absent without leave. An average of one soldier fails ADIP each class, and most of those soldiers fail due to disciplinary problems and eventually end up being separated from the Army. Ingram credits the course for helping identify those soldiers at an early stage. The most common reason for not completing the course, however, is a soldier taking emergency leave.

Opinions about ADIP are, for the most part, positive. Many of the soldiers who have gone through the program indicate it was easier to in-process as a group. However, some soldiers think that those who are married and living off post find it more difficult.

Battery first sergeants found group in-processing less of a drain on the time squad leaders and platoon sergeants need for supervising and training as a unit, time that used to be taken up helping each new soldier accomplish everything ADIP does. "It saves us a lot of time," said SFC Richard Jones, a platoon sergeant from D Battery. "When they come back from ADIP, they're ready to go to work. Soldiers had all kinds of problems when they came in before, and now they're squared away first. Their general knowledge is better,

SFC Homer Puckett, 5/52 ADA, adjusts a soldier's equipment. Complete outfitting of personal field equipment is an important task during ADIP. (Photo by Dan Mock)



#### Air Defense Indoctrination Program Events

- Battalion commander's introduction
- Battalion command sergeant major's introduction
- Weigh-in day one/day 10
- Diagnostic physical readiness test
- Daily physical training
- Random urinalysis
- Battery II test/physical exam
- Dental in-processing
- Initial issue inventory
- TA-50 issue
- TA-50 inventory/inspections
- Wall-locker inspections
- Battalion barracks SOP
- Room inspections
- In-rank inspections
- Victory division standards
- Common tasks-diagnostic tests
- MOS diagnostic test
- Basic skills education program pre-test
- Education center brief
- Re-enlistment brief
- Courtesies and traditions
- Leadership information forms
- Geneva Convention brief
- Code of Conduct brief
- Platoon ARTEP brief
- Early warning systems brief
- Air attack alerts brief
- Driver safety film
- Military driving laws
- State driving laws
- Battalion driver's test
- Army oil analysis program
- Dispatch procedures
- Preventive maintenance checks and services on an M-151A2
- Weapons brief
- Preventive maintenance inspection/test M-16A1
- Zero/qualification with M-16A1
- Four-hour map reading course
- Battalion history brief/test
- Crime prevention brief
- Child abuse brief
- Sexual harassment brief

and they don't have to work so hard to catch up with the others."

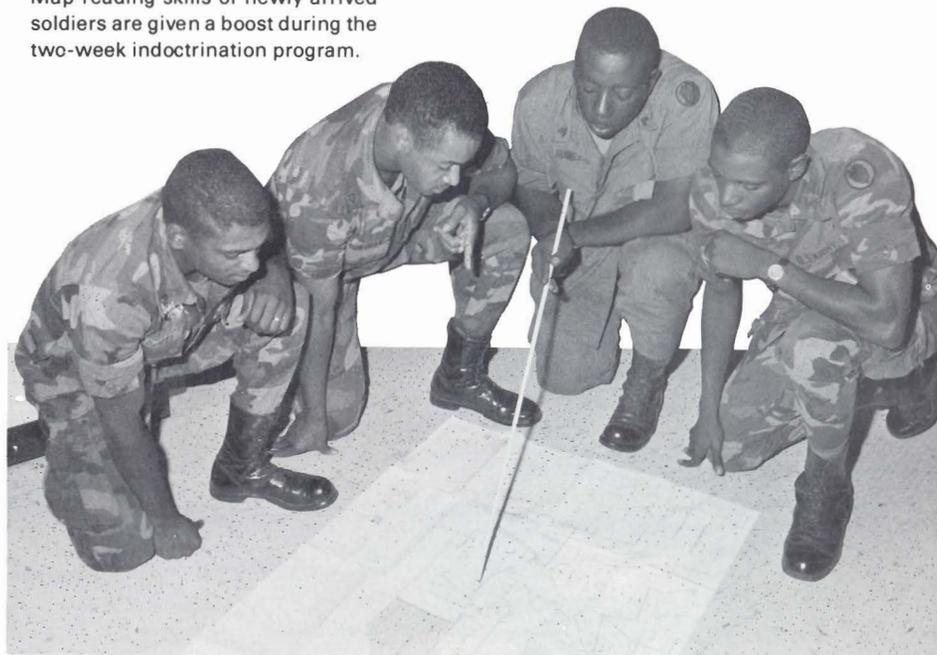
Those associated with the program believe as Jones does, that ADIP improves a soldier's entry into the battalion. "When a guy comes out of the program," Maddox said, "he has a better attitude than just coming into the unit. He's better prepared to handle everything — he's ready to drive, ready to shoot, and physically ready."

Even those who have some negative reactions to the way the program is run say the basic idea is a sound one. The subject that sparked the most mixed opinions was the required participation of sergeants and staff sergeants. Both Maddox and SSgt. Crawford Cross, now running the program with the help of Sgt. John E. Hughes, said the NCOs tend to have hostile attitudes toward the program. Maddox explained, "If I were coming to a unit as an NCO, I would feel I was being pushed down with the troops. But ADIP gives them the opportunity to be in leadership positions." Sergeant Walter Lockhart, who attended ADIP in April 1985, agreed. "The main benefit for NCOs in the program is experience as supervisors, especially when they're newly promoted and haven't had any leadership experience."

Semmens believes the NCO attendance is important because the cadre needs the assistance and reinforcement the NCOs can provide during the course to help achieve all of ADIP's aims.

Attitude plays an important role in the success of ADIP for the soldiers. The attitudes and enthusiasm of the NCOs going through the course can greatly influence their squad members. "In some classes," Cross said, "we have competition among the squads, and the class is really unified. In other classes, it's sink or swim on an individual basis." For Lockhart, unity was the best part of the course. "It was great to see my squad coming together as a team, helping each other," he said.

Map-reading skills of newly arrived soldiers are given a boost during the two-week indoctrination program.



The same influence, however, can have a negative effect if the NCO has a hostile attitude toward the program. Because of this, Semmens and Ingram have been re-evaluating the policy of requiring NCO participation. The hostility of some of the NCOs who have attended the course seems to indicate that sometimes ADIP's aims are not being effectively communicated to the NCOs participating.

Semmens is concerned that ADIP can definitely improve the skills and attitudes of the soldiers entering the battalion. "Most of the participants are highly motivated when they leave the course," he said. Some of the first sergeants and platoon sergeants have also noticed a change, if only in the efficiency and speed with which the soldiers are settled in and ready to go to work. As 1st Sgt. Leroy Austin, of Headquarters and Headquarters Battery, puts it, "I'm just about the oldest first sergeant in SHORAD (short-range air defense), and I wish they'd had ADIP when I was just coming in."

Every other Thursday, an ADIP class graduates and is dispersed among the batteries. If the course's aims have been achieved, these graduates find their entry into the 5/52 ADA to be a little swifter; they have been challenged, have succeeded and bring this success with them as they take their place in the battalion.

*Elizabeth M. Carlson is a free-lance writer who has written several articles on aspects of military life. She has worked as the editor of First to Fire, the 5/52 ADA newsletter.*

# Who Gets How Many of What?

by Maj. Arnold E. Weand Jr.

Never before in the history of the peacetime Army has such an expansive equipment and organizational modernization program been undertaken as the one we find ourselves embarked on today. Numerous new and product-improved weapons have been integrated into Army units, and many more will be integrated in the next five years.

Air Defense Artillery has recently fielded Patriot and Stinger. Other ADA weapon systems, such as Avenger, Excaliber, Setter and an evolutionary

surface-to-air missile system referred to as ESAM are still in the conceptual or developmental phase.

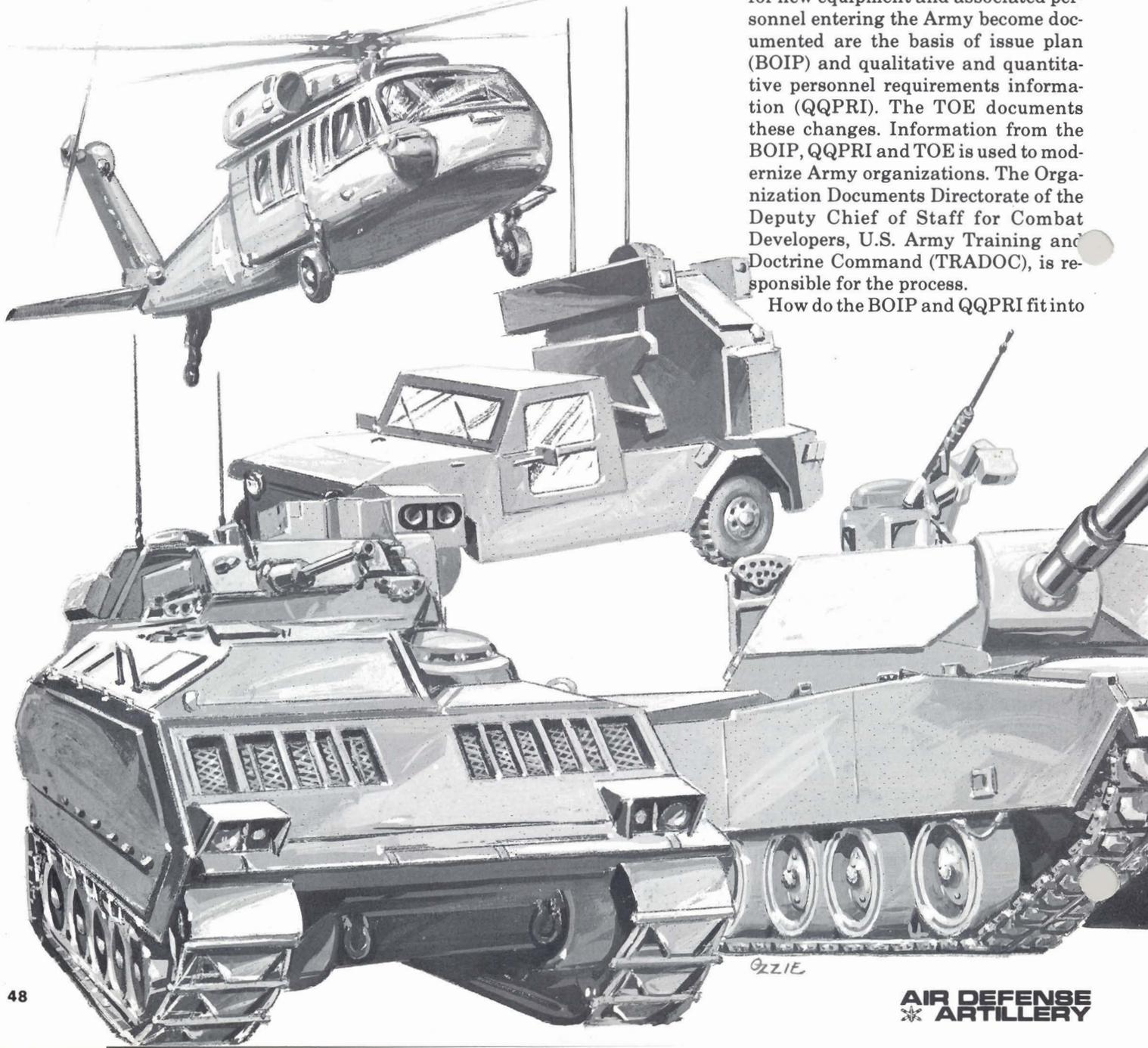
But the modernization affects the total Army, not just Air Defense Artillery. Each component, the Active Army and the Reserves, will be receiving new and different systems. Because we usually think only of major systems such as Patriot or the M-1 tank, we fail to realize that every branch of the Army is acquiring new equipment items, many components and a myriad

of test, measurement and diagnostic equipment. Currently the Army has more than 2,113 items in the documentation process for eventual entry into the Army inventory.

Each of these new items may require new or revised military occupational specialties, additional skill identifiers, TOEs and modified TOEs. Sheer numbers alone indicate a documentation problem clearly exists and will continue to exist. Improvements will continue until the modernization and documentation system is able to keep up to date. One of the keys to improving the process is to have people, like you, who influence but don't work with the system, understand the documentation development process and how they can affect it.

The means by which requirements for new equipment and associated personnel entering the Army become documented are the basis of issue plan (BOIP) and qualitative and quantitative personnel requirements information (QQPRI). The TOE documents these changes. Information from the BOIP, QQPRI and TOE is used to modernize Army organizations. The Organization Documents Directorate of the Deputy Chief of Staff for Combat Developers, U.S. Army Training and Doctrine Command (TRADOC), is responsible for the process.

How do the BOIP and QQPRI fit into



the acquisition cycle? It is first necessary to understand that a BOIP is for an item, not a system. For example, the Bradley Fighting Vehicle has 3 different BOIPs. Near Milestone I of the life cycle management model (the process by which the Army develops and acquires new equipment), TRADOC, as the combat developer, enters into an agreement with the materiel developer. The U.S. Army Materiel Command is the primary materiel developer, but the Office of the Chief of Engineers, Information Systems Command, Office of the Surgeon General, Intelligence and Security Command, Computer Systems Selection and Acquisition Agency and the Defense Communications Agency can also function in a materiel-developer role.

An approved letter of agreement permits the materiel developer to enter into Milestone I of the acquisition cycle. During the period between Milestones I and II, the developmental item is identified; the operational and organizational plan is updated; test, measurement and diagnostic equipment is identified; and military use of the item is validated. Using this information,

the TRADOC proponent prepares and staffs the draft materiel requirement documents, after which the materiel development command or project manager requests the developmental line item number and prepares the tentative BOIP feeder data. The BOIP feeder data includes the known associated support items of equipment and components. The tentative BOIP data is provided to the new equipment training branch or division of the appropriate materiel readiness command, which uses it to develop the QQPRI. The completed documents are forwarded to the Army Equipment Authorization Review Activity, an agency of the Office of the Deputy Chief of Staff for Supply, Maintenance and Transportation, Headquarters, U.S. Army Materiel Command.

The U.S. Army Equipment Authorization Review Activity reviews all BOIP feeder data and QQPRI for the Army Materiel Command and also provides quality control. The review is for completeness, conformity to the requirements document, inclusion of key agency input and assurance that both documents address the same known associated support items of equipment and components. The activity marries the two documents and forwards them to TRADOC as a package.

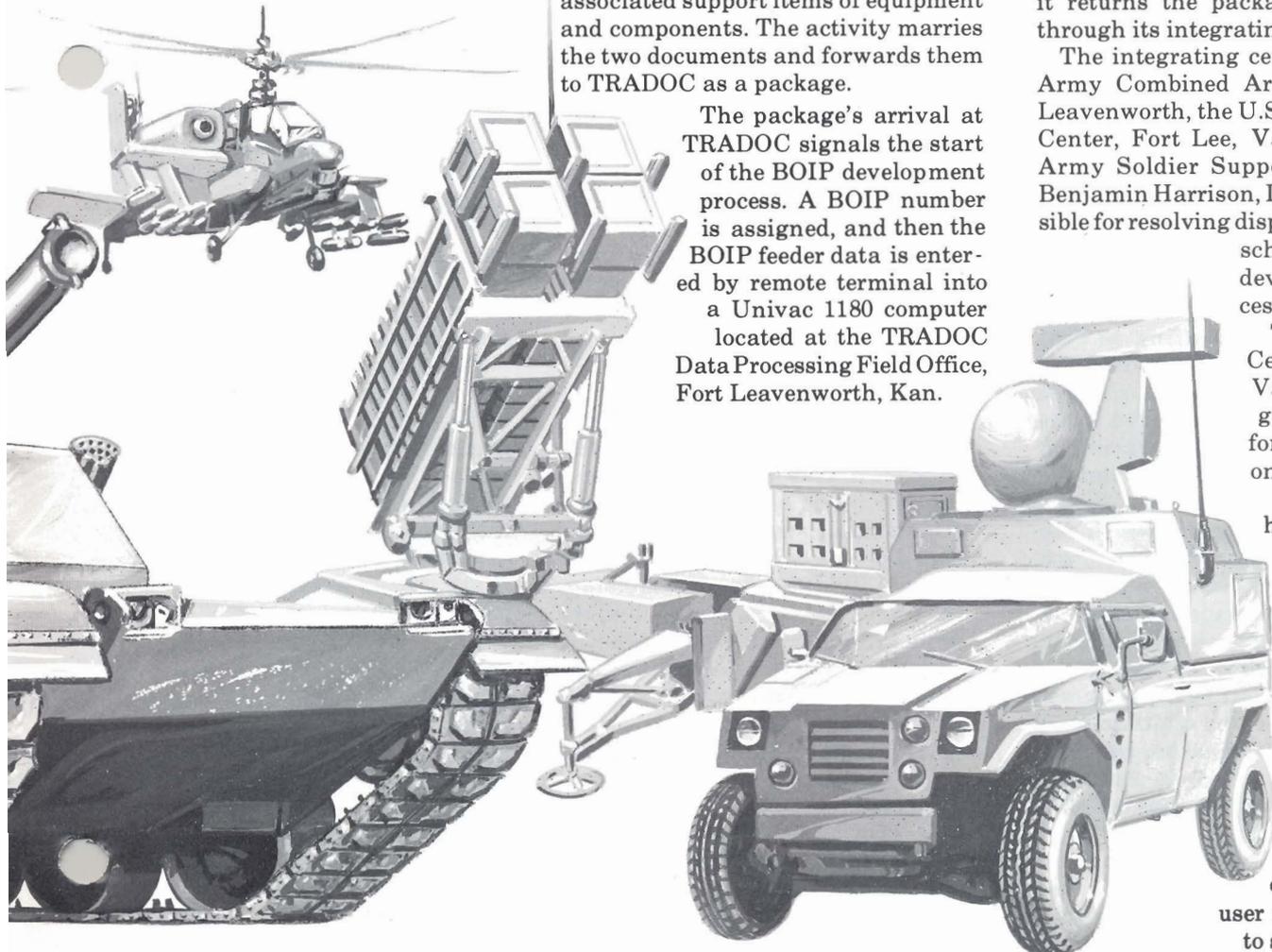
The package's arrival at TRADOC signals the start of the BOIP development process. A BOIP number is assigned, and then the BOIP feeder data is entered by remote terminal into a Univac 1180 computer located at the TRADOC Data Processing Field Office, Fort Leavenworth, Kan.

An equipment and manpower analyst reviews both the BOIP and the QQPRI and forwards them to the proponent school for development. Information copies are sent to the integrating centers and other interested schools. The organization branch of the school's combat development directorate is responsible for developing the complete BOIP.

A key element in the process is the operational and organizational concept, used to determine the basis of issue (who gets it) and employment (where and how it will be used). Another part of the development is the assessment of the new item's training impact. The training community at each school addresses the impact of new equipment on individual training and identifies new skills that must be taught during MOS-producing courses. The proponent school coordinates with other interested schools (any school that has an MOS or should have an MOS included in the QQPRI) and incorporates their comments into the BOIP and QQPRI. Once the school has received and incorporated the comments and training impact from the other schools, it returns the package to TRADOC through its integrating center.

The integrating centers — the U.S. Army Combined Arms Center, Fort Leavenworth, the U.S. Army Logistics Center, Fort Lee, Va., and the U.S. Army Soldier Support Center, Fort Benjamin Harrison, Ind. — are responsible for resolving disputes among their schools during the developmental process. The U.S. Army Training Support Center, Fort Eustis, Va., is also an integrating center, but for training devices only.

Once TRADOC has received the BOIP from the centers, hard copies of the BOIP are produced and forwarded along with the BOIP feeder data (and QQPRI if new MOSs or additional skill indicators are envisioned) to all user major commands to solicit their input.



The major commands get a first look at an item up to eight years before fielding in the case of a tentative BOIP, and not later than 30 months before fielding of a final BOIP.

During the major command staffing cycle, TRADOC conducts its internal staffing. The BOIP branch provides the BOIP, QQPRI, training impact and school and center input to the systems training directorate within the Office of the Deputy Chief of Staff for Training and to the TRADOC system staff officer in the appropriate hardware directorate within TRADOC headquarters. This staffing gives planners a final look at these documents to ensure that the operational and organizational concepts and doctrine specified by the school and center are in consonance with the latest TRADOC doctrine.

The documents used for internal staffing, plus comments from internal staffing, and a resources cost report, called an impact report, are forwarded to the Soldier Support Center's National Capital Region for a proposed MOS decision. The National Capital Region is a TRADOC activity that has the expertise to perform a detailed MOS analysis and assess the impact of a new item or system upon MOSs and career fields. The National Capital Region, in close coordination with the Office of the Deputy Chief of Staff for Personnel, the U.S. Army Military Personnel Center and, when civilian man-hours are involved, the U.S. Army Civilian Personnel Center, develops and returns the proposed MOS decision to TRADOC.

Once TRADOC staffing is complete, the BOIP normally undergoes a computer-completed automated update to ensure the TOEs contained in the BOIP file are the same as those contained in the current TOE master file. A final review is conducted by the TRADOC review boards, which provides the final quality assurance check. The board revalidates requirements to ensure that only minimum essential wartime requirements are included. The board determines if the basis of issue reflected in the BOIP is supported by the operational and organizational plan and materiel requirements document. The board also determines if consolidation at higher units will eliminate dual capabilities.

Then TRADOC takes the documents used for Soldier Support Center and National Capital Region staffing, adds the proposed MOS decision and requirements documents, and forwards

the package to the Office of the Deputy Chief of Staff for Operations and Plans, which is responsible for staffing the BOIP package. The Force Developments and Requirements Division staffs the BOIP package within the Army Staff, soliciting comments and recommendations on the BOIP-proposed MOS decision and QQPRI. Based on the comments and recommendations received, the materiel requirements document is approved and the BOIP is approved with any directed changes. The division returns the approval along with publication instructions and the final MOS decision to TRADOC. After the BOIP is Army-approved, it continues to be updated semiannually to ensure its correctness until the division directs TRADOC to apply the BOIP to TOEs.

One should note that the process described is the same for either a tentative or a final BOIP. The tentative BOIP is initiated with the letter of agreement at Milestone I, and the tentative BOIP package (BOIP, QQPRI and requirements document) must be Army-approved before entering into Milestone II. Between Milestone II and Milestone III, the same process is repeated for the final BOIP. The final BOIP package must be Army-approved before entering into production. The final step required to get the BOIP into TOEs is accomplished by TRADOC through the consolidated TOE update, which is published once a year in April or October.

The recent documentation modernization study chaired by the Army's vice chief of staff has made significant changes in how this is done. The major changes are:

- The BOIP is kept in a separate file and added to the TOE after all distribution of the equipment has been completed. This is known as the "living TOE concept." It means the total requirement for equipment and associated personnel is the TOE plus all ensuing BOIPs. Major commands that develop TOEs for individual units will add the BOIPs to the modified TOEs as the equipment is distributed.

- Doctrinal implications of establishing TOE levels based solely on 10-percent manpower decrements are examined.

- A TOE "telephone book" containing TOEs in various configurations will be developed. The listing will be arrived at by applying different mission-essential BOIPs.

Published in October 1983, Consoli-

dated TOE Update 8310 has now been established as the data base for all future changes. In April 1984, TRADOC began work on the publication of three files for the update. The first file contains the base TOE updated with administration changes. The second contains all substantive changes (alterations in quantity of people or equipment). And the third contains all Army-approved BOIPs not contained in the TOE file. As part of the effort to make modified TOEs more closely resemble the TOEs, new unit TOEs, such as the one for the light air defense artillery battalion, will be developed based on equipment on hand or expected to be on hand at the time the unit is activated. The BOIPs for equipment and associated personnel are available at the time BOIPs are added to the modified TOEs.

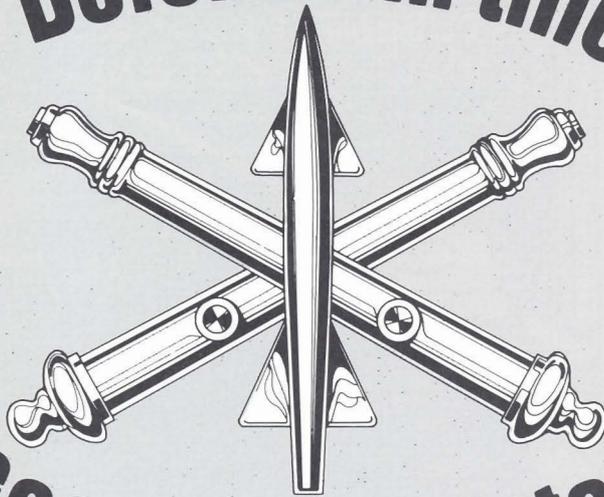
At the same time, the Department of the Army is establishing resources for the BOIP for the third file. This is being accomplished through a program development increment package (PDIP). The PDIP identifies and justifies the changes caused by the application of the BOIP and links the personnel and materiel resources needed to accomplish the application. The PDIP bridges the gap between the program objective memorandum and the budget. It may encompass Active and Reserve Component combat, combat support and combat service support units. It will align strength authorizations with strength requirements, implement the general officer steering committee and the select committee decisions, and allow major commands to modernize the units they designate.

The major commands will then use the resources identified by the PDIP and budgeted for in the program budget guidance to modernize the applicable units during the management-of-change window. This process allows the units to maintain specified readiness levels by adding equipment and making personnel changes over a period of time.

The system works, the process is thorough, and continual improvements will be made to ensure the Army in the field is equipped with the most modern weapon systems and has the personnel assigned to operate and maintain them.

*Maj. Arnold E. Weand Jr. is a manpower and equipment analyst assigned to the Office of the Deputy Chief of Staff for Combat Developments, Headquarters, U.S. Army Training and Doctrine Command, Fort Monroe, Va.*

# Air Defense Artillery



## Goes Regimental

Combat arms soldiers throughout the Army can now be affiliated with one of the more than 160 regiments of the Army Regimental System.

The regimental system was reintroduced in 1983 to enhance combat effectiveness and strengthen a unit's cohesion and esprit de corps.

The regimental system benefits both soldiers and the Army, said Brig. Gen. Leslie E. Beavers, director of Personnel Plans and Systems, Office of the Deputy Chief of Staff for Personnel, Washington, D.C. "Soldiers will have the opportunity for long-term identification with a unit. They will have the potential for recurring assignments. They can also more directly participate in the history, customs and traditions of the U.S. Army," he said.

Phase II of the system will affect every soldier in the Army, whether he is combat arms, combat support or combat service support. Plans to identify regiments for the combat support and service support soldiers are expected to be finalized by the end of FY 1986.

Combat arms soldiers can sign up for a regiment of choice now, even though only 27 of the more than 160 regiments will be implemented by the end of FY 1986, Beavers said. Soldiers may change their affiliation anytime they wish, he added.

Army Chief of Staff Gen. John A. Wickham Jr. directed there be no limit on the number of soldiers who can sign up for a specific regiment. This policy, however, does not guarantee an assignment to that regiment. Beavers said that regimental affiliation will be

an important assignment consideration once the soldier's regiment is implemented. "Our soldiers need to know that no assignment guarantee can be made. They will serve not only in their regiment but in other regiments and other non-regimental duty positions in order to meet their own professional development needs as well as Army requirements," he said.

Beavers indicated that once implemented, the regimental system will

promote a sense of loyalty and unit esprit. "Soldiers will be able to serve with their comrades and enjoy a sense of belonging," he said. Beavers also said that this will enhance unit readiness while allowing the Army to stabilize force structure and modernization changes.

Lt. Col. William P. Falke, from the Military Personnel Center's Regimental Systems Branch, said that more than 25,000 soldiers are already affiliated. He explained that in the very near future the adjutants of the 15 existing regiments and the 12 programmed for 1986 will be provided rosters so soldiers currently in those units can sign up with their preferences.

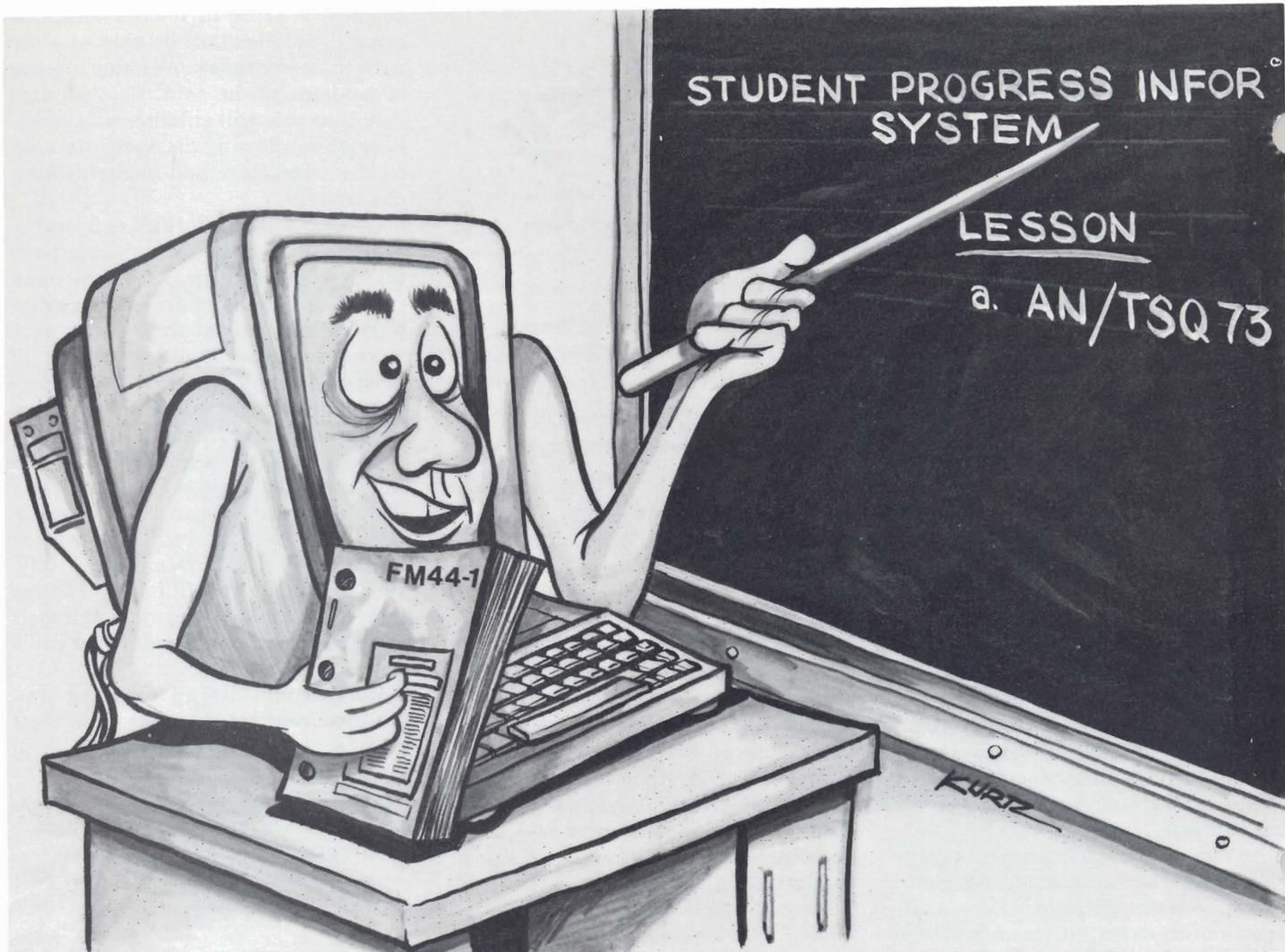
Falke added that combat arms soldiers assigned to units not yet affiliated with a regiment will be contacted by a personnel team. Beginning in mid-1986, soldiers can affiliate or change their affiliation anytime through their local military personnel offices or while in-processing at new units.

Further details on existing and planned regimental units and their unit locations can be obtained from local military personnel offices.

The following Air Defense Artillery regiments are identified by the battalion locations in the United States and overseas. An asterisk next to the post indicates the regimental headquarters.

REGIMENT	U.S. LOCATION			OVERSEA LOCATION		
	Current unit		New unit	Current unit		New unit
1st ADA	1/7	Fort Bliss, Texas	3/1	3/59	32nd AADCOM, Germany	4/1
	1/65	*Fort Bliss, Texas	2/1	2/62	32nd AADCOM, Germany	1/1
2nd ADA	New Bn.	*Fort Bragg, N.C.	1/2	New Bn.	V Corps, Germany	4/2
	New Bn.	Fort Hood, Texas	2/2	New Bn.	VII Corps, Germany	5/2
	7/7	Fort Ord, Calif.	3/2			
3rd ADA	1/55	Fort Polk, La.	3/3	2/59	1st AD, Germany	6/3
	2/67	Fort Riley, Kan.	2/3	3/67	3rd ID, Germany	4/3
	4/61	*Fort Carson, Colo.	1/3	1/59	8th ID, Germany	5/3
4th ADA	1/3	Fort Campbell, Ky.	8/4	2/60	32nd AADCOM, Germany	2/4
	3/4	Fort Bragg, N.C.	3/4	6/56	32nd AADCOM, Germany	5/4
	1/67	*Fort Lewis, Wash.	1/4			
5th ADA	2/5	Fort Hood, Texas	2/5	2/61	2nd ID, Korea	5/5
	1/68	Fort Hood, Texas	4/5	3/61	3rd AD, Germany	3/5
	5/52	*Fort Stewart, Ga.	1/5			
7th ADA	New Bn.	*Fort Stewart, Ga.	2/7	6/3	Kaiserslautern, Germany	1/7
	New Bn.	Fort Lewis, Wash.	8/7	New Bn.	Bitburg, Germany	5/7
				2/3	Dexheim, Germany	4/7
43rd ADA	1/43	*Fort Bliss, Texas	1/43	New Bn.	Ansbach, Germany	6/43
	3/3	Fort Bliss, Texas	3/43	4/3	Giessen, Germany	4/43
	New Bn.	Fort Hood, Texas	5/43	8/3	Giebelstadt, Germany	8/43
			2/43	Hanau, Germany	2/43	
52nd ADA	1/4	*Fort Lewis, Wash.	1/52	6/52	32nd AADCOM, Germany	6/52
	3/68	Fort Bragg, N.C.	2/52	1/1	32nd AADCOM, Germany	3/52
62nd ADA	1/51	*Fort Ord, Calif.	2/62	1/62	25th ID, Hawaii	1/62
	New Bn.	Fort Drum, N.Y.	3/62	New Bn.	6th ID, Alaska	4/62
	4/1	Fort Bliss, Texas	5/62			

NOTE: Based on the Force Accounting System, July 1985. Units and locations are still subject to change.



# Can Computers Teach?

The Air Defense Artillery School's Student Interactive Training System is part of a new approach to institutional training that will soon be imitated in the field

by James E. Ball

**T**he Student Interactive Training System (SITS), in use at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, is a versatile, integrated, computerized learning center that uses microcomputer and videodisc methodology. It's the first ADA computer-aided training system to evolve from an emerging technology that is already revolutionizing training at the institutional level and will soon change the way units train in the field.

The SITS requires virtually no contractor support. It uses text, graphics, video sequences and a touch-sensitive display console that encourages student participation to deliver highly effective, interactive lesson presenta-

tions. The system, in short, provides the student with a complete learning environment.

A menu-driven software package called the Coursewriter allows military personnel or government civilian employees to develop SITS lessons. Written in Applesoft Basic language, the Coursewriter's sequence of instructional programming routines can be easily performed by operators unskilled in computer programming.

Another software package, the Student Progress Information System, assigns, terminates or reassigns all lesson modules and allows an instructor to track each student's cumulative progress through an entire course. It also automatically computes each student's progress index, time in the course and the number of lessons completed. The

system warns a course manager, or other user, when a student has a progress index greater than one (an indication of below-standard performance) by causing the progress index number to flash on the student's index card. The Student Progress Information System also helps reduce administrative workloads. It can maintain records for six classes in residence at one time with a maximum of 50 students per class.

## Current Applications

The Air Defense Artillery School has decided to aggressively integrate SITS training techniques into several institutional courses. Computer-aided instruction courseware in leadership, counseling, map reading and air defense artillery tactics has been developed, but the main impetus is in the

training maintenance area where the SITS is considered to be particularly cost-effective.

The system is currently being used in the classroom to teach soldiers how to maintain the AN/TSQ-73 Missile Minder. Approximately 100 hours of instruction for the 25L MOS (AN/TSQ-73 Air Defense Artillery Command and Control System Operator/Repairer) have been developed, and more will follow. Feedback from both students and instructors indicates a positive attitude and a high acceptance level for the SITS as a classroom training system.

Interactive video operator and maintenance courses are also being designed for Patriot, Chaparral and Hawk. Courses for other weapon systems are under consideration.

Based on Air Defense Artillery School observations and experiences as well as independent analyses, it can be said that SITS is a relatively efficient and cost-effective instructional delivery system that can substitute for the actual equipment or material in many aspects of a training program. It was not conceived as a total replacement for "hands-on" training on the actual equipment, but it does allow for extensive preliminary or preparatory instruction prior to training on actual equipment. Hence, a training manager using the device should be able to use training time more efficiently, thereby reducing the need for expensive weapon systems for institutional training purposes.

#### Future Development

The development of SITS has been a pioneering effort in computer-based training at the Air Defense Artillery

School. However, it is not the ultimate device. The system is considered a forerunner for a new development called the Electronic Information Delivery System (EIDS). The EIDS is a class of microcomputer, interactive videodisc systems currently under development for use Armywide. The new systems will be used for training and technical data delivery within the Army's line units.

Anticipating the transition to EIDS, the Air Defense Artillery School has acquired several microcomputer systems configured to meet EIDS specifications and is currently using them to develop courseware that will be compatible with EIDS hardware. A plan for courseware production and distribution is being developed so that the EIDS courseware and equipment will be available concurrently for institutional training and sustainment training in line units for particular subject areas. The plan relies on a mathematical model, being developed by the Air Defense Artillery School, which will determine what portion of a resident course needs to be exported to the field as well as the type of supporting EIDS courseware and hardware that will be needed. The idea is to ensure that a complete training package is delivered to a specific unit in a priority sequence.

The mathematical model is also intended to ease the transition of the Army's Correspondence Course Program and Training Extension Courses (TEC) to EIDS. Efforts are already underway to develop air defense artillery TEC lessons in an EIDS format for the Hawk missile system. The Air Defense Artillery School has commis-

sioned a pilot project to convert written text into 12 computer program TEC lessons. Other EIDS-type projects produced 150 hours of interactive videodisc courseware in FY 1985, and an additional 238 hours of Patriot instruction are being developed.

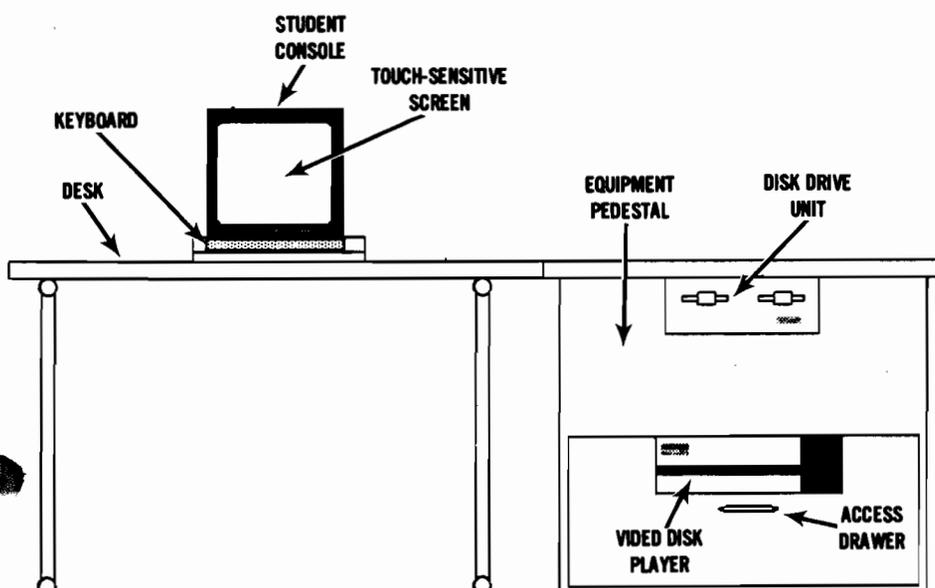
A recent issue of the *Journal of Computer-based Instruction* stated that "Computer technology brings to the classroom learning environment a unique instructional delivery that requires investigation and testing. The research question is not 'Can a computer teach?' any more than we would ask 'Can a book teach?' Instead, it is a series of questions requiring simultaneous programmatic research, learning, instruction and technology."

The Air Defense Artillery School has been researching these questions, exploring the latest technology and developing answers, equipment and instructional techniques for computer-based instruction for several years. Beginning in 1982, as a joint effort with the U.S. Army Training Development Institute, Fort Monroe, Va., and the U.S. Army Communicative Technology Office, Fort Eustis, Va., the Air Defense Artillery School embarked on a course to develop a computer-based training program using interactive video simulation. The impetus behind this effort was the need to develop alternative training techniques to accommodate the training requirement for operator and maintainer proficiency on sophisticated, expensive weapon systems that were in limited supply at the institution. Generally, there was a more compelling requirement for the use of tactical weapons in combat-ready roles.

While the emergence of interactive video as an instructional technology at the Air Defense Artillery School had an obviously significant potential, a great deal of empirical and validation studies had to be conducted to prove the concept before the full-scale implementation of SITS training could begin. An independent consultant, Dr. Gary L. Hull, Ph.D, of the University of Southern Illinois was solicited to test and evaluate the system. Hull concluded that SITS was a highly effective instructional system. He also concluded, through cost analysis, that SITS is an economically effective alternative to current teaching methods.

James E. Ball is a training specialist in the Applied Technology Branch, New Systems Training Office, Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.

Student Interactive Training System





# The Best Little NCO Academy in the



The Fort Bliss NCO Academy is the best in the Army. Most soldiers who attend the academy wear ADA insignia. They are going to graduate and become the best NCOs in the Army. You have the word of the soldiers who run the academy. And they intend to see things stay that way.

Sergeant Major George Bradford has been telling everyone that the Fort Bliss Non-commissioned Officer Academy is the best in the Army ever since the day he arrived at the academy. This was back in 1982 when Bradford was the academy's assistant commandant and before he became commandant. Over a cup of the Army's best coffee in the Army's best mess hall, he would tick off the reasons the academy ranks No. 1: "We've got the best students, the best cadre, the best instructors and the best program of instruction."

The Fort Bliss NCO Academy, located in what was once the post stockade, is surrounded by desert. The site was chosen, presumably, so that prisoners escaping from the old stockade would have a long lope across the sand dunes and cactus. At first, the staff was a little worried about the new facility. The stockade's cyclone fence, the guard tower, the barred cells were ever-present reminders that the academy's new home had once been the residence of soldiers who were *not* the Army's best. It was as if the place was somehow tainted by the ghosts of soldiers

unwilling to put forth the effort it takes to become the best.

So they set about turning the old stockade into a showplace. They tore down portions of the cyclone fence, converted the holding cells into storage rooms and adorned the walls with murals and slogans. Next, they lined the hallways with uniformed mannequins to demonstrate the proper wearing of the uniform and designed a special room — a type of shrine — dedicated to the NCO and NCO traditions. The room is called the "Room of the NCO," and there is no other like it in the Army. The little touches have made the former stockade not only the best NCO academy facility in the Army but also the most unique.

The Army assigns no rankings to its 30 NCO academies, but the cadre thinks it should be obvious to anyone who knows anything about the Army or soldiers that the Fort Bliss NCO Academy is the best. To think otherwise, they believe, requires a great leap of the imagination. "Look around," Bradford tells the dubious. "All you have to do is look around."

Look around and what you see is excellence reflected in the spit and polish gleam of the hallways, in the enthusiasm with which the staff attacks even minor assignments, in the crispness the students take on halfway through their month at the academy. During a recent visit, a U.S. Army Training and Doctrine Command (TRADOC) accreditation team gave the Fort Bliss NCO Academy an outstanding rating and could offer no suggestions for improvement. It was, the academy staff concedes, the best rating any NCO academy received during the accreditation period.

Units are supposed to send only their best soldiers to the NCO Academy. The



# Army

by Blair Case

soldiers are selected from merit lists, and academy staffers think commanders who send second-rate soldiers to the academy are guilty of a type of sabotage that borders on treason.

"The NCO Academy is a big career step for a soldier," Bradford said. "Units are supposed to send only their best soldiers. A commander who thinks he can't afford to lose his best soldier and sends another instead cheats the better soldier and the Army, because the soldier who graduates from the academy is the soldier who is going on to leadership positions. We've got to place our best soldiers in leadership positions, not our second best."

Fort Bliss is the only Army post in the world where you can see the entire Non-commissioned Officer Education System, from basic training to the Sergeants Major Academy at work. Most students entering the NCO Academy take the Primary Leadership Course and the subsequent Basic Non-commissioned Officer Course.

The Primary Leadership Course represents the first level of NCOES professional education. It is an arduous four-week resident course that prepares junior NCOs to lead soldiers in combat. The Basic Non-commissioned Officer Course (BNCOC) is a five- to six-week, live-in, MOS-tracked course that prepares E-5s and E-6s to lead, train and supervise soldiers under their command. The two courses are the only formal resident military training that most NCOs receive between basic training and retirement.

The first priority for attendance includes soldiers in the grades for which the courses are designed; second priority goes to soldiers, except E-3s, one or two grades lower who are working in the next higher grade-level jobs. For example, first priority for BNCOC is

given to untrained E-6s while second priority is given to E-5s or E-4s serving in E-6 duty positions.

Soldiers must meet the following prerequisites to be placed on an order of merit list:

- Soldiers in MOSs with job books must be trained in 70 percent of all MOS tasks listed in the job book within the past six months (waiverable by an 0-5-level commander).
- Soldiers must have passed a skill qualification test within the past 12 months (waiverable by an 0-5-level commander).
- Soldiers must have passed the Army Physical Readiness Test within the past six months.
- Soldiers must meet weight and physical fitness standards outlined in AR 600-9 and AR 350-15. Soldiers who exceed screening table allowances must bring evidence of pinch test results and correct maximum allowable weight. Overweight soldiers will not be enrolled.
- Soldiers must be eligible to re-enlist. Soldiers who attend incur three-month service obligations. Soldiers selected for attendance with less than three months of service remaining must bring documentation of pending re-enlistment.

Training begins early in the morning and ends late in the evening. Primary Leadership Course students must endure a stress-oriented tactical field exercise. Billets must be prepared for inspection at all times. Inspections are frequent, and demerits are handed out liberally. One to 25 demerits result in extra training or details; 26 to 50 demerits result in extra training or details and no pass; 51 to 75 demerits result in extra training or details, no pass, no visitors and a dismissal warning; 75 to 100 demerits result in dismissal based upon poor attitude or motivation. Soldiers eliminated for disciplinary reasons or lack of motivation can find themselves removed from the Army promotion standing list, prevented from re-enlisting, subjected to non-judicial punishment and subject to reclassification action.

Soldiers can balance their demerits account with merits. It takes two merits to erase one demerit. Merits can be earned by volunteering for merit work details or by exceeding standards of appearance or task requirements. Training includes classroom instruction and field exercises.

All grading is done on a GO/NO GO basis; there are no academic averages.

Students who receive a NO GO are counseled by an instructor, retrained and retested. Students who receive three successive NO GOs on the same task are subject to academic dismissal. Students who are dismissed for academic deficiency are ineligible to re-enroll for six months.

Rank has no privileges at the NCO Academy. Regardless of their actual rank, soldiers enrolled at the academy are addressed as "student" by both other students and Academy personnel. Students who occupy student leadership positions are addressed by the position title, such as "platoon sergeant."

"The primary thrust of the academy is training," Bradford said. "We train leaders and potential leaders. A student's leadership qualities and overall conduct are important and are carefully observed. We don't put up with misconduct or poor attitudes. Soldiers who demonstrate either of these traits are sent back to their units. We expect soldiers to take pride in their selection to attend the course, and we expect them to apply themselves in a conscientious manner. We expect them to respect their fellow student, to work as a team member and to contribute to the success of their classmates whenever possible. In return, students can expect the best leadership training the Army has to offer. They can expect to be challenged. The training is rigorous, demanding and very regimented. We teach strict Army doctrine, but it is current and up-to-date doctrine," Bradford said.

The Fort Bliss NCO Academy, in other words, is no picnic, but despite the academy's spartan standards, soldiers appear to enjoy their stay at the former stockade.

"The NCO Academy is serious business, and students are separated from their families, but most enjoy the training," said Bradford, who was scheduled to retire this January. "It's the first rigorous training most of them have had since basic training. Some feel they've grown a little rusty, and the NCO Academy sharpens them up again. For a lot of students, the NCO Academy is the place where they make a serious commitment to the Army as a lifetime career."

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*Command Sergeant Major Harry L. Johnson has replaced recently retired CSM George Bradford as commandant of the Fort Bliss NCO Academy.*

# Scanning

## **ADA Commanders' Conference**

Keeping worldwide air defense artillery units updated on new trends and developments is a task that the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, continually conducts.

The annual ADA Commanders' Conference, held at Fort Bliss, is one of the key elements in disseminating information to the air defense community. This year's three-day event, March 4-6, will include attendees from Germany, Italy, Korea, Japan, Alaska and numerous stateside ADA units.

The conference will consist of presentations, discussions and social activities designed to present an up-to-the-minute overview of current ADA command, training and doctrinal developments. Attendees will be given the opportunity to interface with the school staff members and provide input on air defense issues.

An estimated 300 people, primarily Army personnel, will attend the conference. Representatives from Department of the Army, Training and Doctrine Command, Forces Command, Army service schools, Air Force and Marine Corps will also be present.

## **Oops!**

There was an error in both charts that accompanied the article "Doctrinal Literature Program Reshaped," *Air Defense Artillery*, Fall 1985 (Pages 45, 46).

The correct title of FM 44-30 and of FC 44-30 is "Visual Aircraft Recognition" and not "Aircraft Recognition Training for Ground Observers."

## **New CALFEX Circular Published**

The proliferation of high-tech weapons on the modern battlefield has been accompanied by skyrocketing operational, maintenance and training costs. Through the efficient use of sophisticated simulation devices such as conduct-of-fire trainers, valuable training resources can be conserved while training soldiers to standards in a wide variety of individual and collective skills. However, no simulation can completely replace the need to exercise a unit in a realistic, live fire environment, nor in realistic, opposing force maneuvers. Ammunition, fuel and spare parts for training events can and must be husbanded where they will provide the greatest benefit in combined arms training proficiency.

Field Circular 71-4, Combined Arms Live Fire Exercise (CALFEX), October 1985, provides the Army in the field with complete guidance for the development of live fire, combined arms training.

It gives the user a thorough list of planning considerations to integrate all members of the combined arms team and a detailed formula for resource coordination including ammunition data, target emplacement guidance and safety diagram procedures. Four sample scenarios are provided based on the generic multipurpose ranges at Gowen Field, Idaho; Grafenwoehr, West Germany; and Fort Benning, Ga. A sample letter of instruction and control plans are also included to assist in planning.

The challenge is ours to train as we will fight: on a battlefield where all members of the combined arms team must overcome electro-optical, thermal and electro-magnetic interference; on which we must move fast and strike the enemy at his most vulnerable point in place and time to destroy his ability and will to fight; at night, in deplorable weather and in an active chemical environment. Field Circular 71-4 provides the heavy force with a method to meet that challenge.

Distribution will be made to all members of the close combat (heavy) force to battalion and squadron level. Activities desiring additional copies may obtain them through the Armor School's Armywide Training Support Branch. Write to Commander, U.S. Army Armor Center, ATTN: ATZK-DPT-NRT (AWTS), Fort Knox, KY 40121.

## **Excalibur's Successor Tested**

Soldiers from B Battery, 1st Battalion, 67th Air Defense Artillery, Fort Lewis, Wash., are putting the new Vulcan wheeled carrier through the rigors of a five-phase testing program. The Army Development and Employment Agency and the Combat Development Experimental Center are acting as data collectors for the testing of the vehicle.

The vehicle is the final model, for which the Excalibur, tested in 1984, was the prototype.

The Vulcan wheeled carrier has a basic load of 2,500 20mm rounds and requires a three-man crew. Its cross-country mobility is claimed to approach that of a tracked carrier. The vehicle has a diesel engine and uses the same type of wheels and tires as the high-mobility, multipurpose wheeled vehicle.

The 1/67th ADA will keep the vehicle in the unit indefinitely. (*Ranger*)

## **Program Seeks to Help Weapon Users**

A program to make weapon systems easier to operate and maintain has begun at U.S. Army Missile Command, Redstone Arsenal, Ala.



A program designed to improve operation and maintenance will be applied to all Missile Command's systems, such as Stinger.

The Manpower and Personnel Integration (MANPRINT) program implementation plan was officially approved last July. Although MANPRINT will be applied to all the Missile Command's systems, three have been selected as test-beds. These are the fiber optic guided missile, the joint tactical missile system and the advanced manportable weapon system.

Improving the interface between soldier and machine is the program's goal. It encompasses such considerations as human-factors engineering, manpower, personnel, training, health hazards and safety. These factors will be applied to evaluation or independent research and development programs, to all the phases of an acquisition program, and to fielded system reviews. (*Redstone Rocket*)

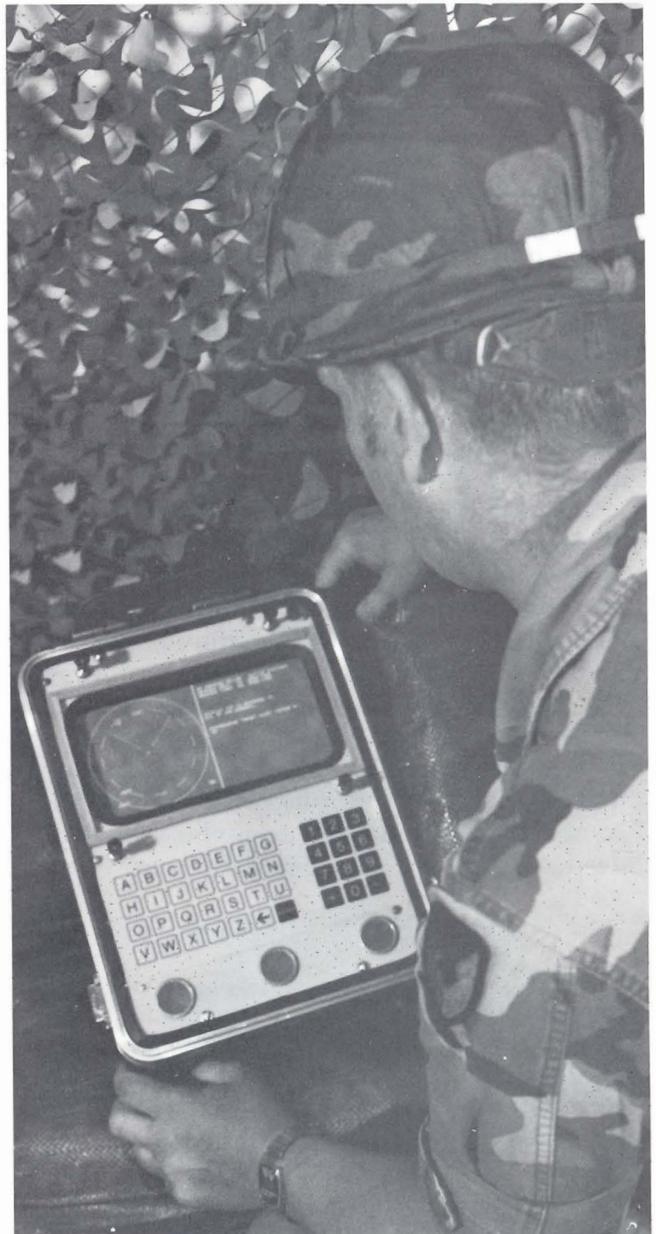
#### Early Warning Systems Evaluated

Soldiers from the 9th Infantry Division, Fort Lewis, Wash., recently investigated different formats for displaying air defense early warning information. The Army Human Engineering Laboratory conducted the evaluation with support from the Joint Chiefs of Staff and the Joint Forward Area Air Defense test agency.

Presenting usable information at the fire unit

level is a significant challenge. SHORAD fire units are already busy trying to do the work associated with their weapon systems and tactics. The information given to them about incoming aircraft must be in the most easily understood form possible so the soldiers can make the best use of it. Data gathered at Fort Lewis will be used to evaluate the concept of the electronic display at the fire unit level. The research will also help refine the specific design of this type of display.

Within the experiment, several variants on the fire unit display were evaluated. A UH-1 helicopter flew varying routes toward the area where air defense artillery test teams were to search and detect the helicopter. Team members were shown



A Stinger gunner looks at the fire unit display for information on approaching aircraft. The device shown here has been developed for evaluation of human-factor issues. (U.S. Army photo by Michael Barnette)

three different alerting formats to see which provided the greatest visual detection range. They also were shown three degrees of precision for target cueing to see whether partial displacement would affect detection range. Three different orientation formats were presented to the team members as were two methods of using landmarks.

One team received information about the approaching aircraft on an electronic display, showing the direction of approach, the approximate location of the aircraft and the estimated time it would take the aircraft to reach the air defense team's position.

A second team received verbal information about the approaching aircraft and plotted its course on a map grid, which is the method SHORAD units currently use. The third team received no cueing information at all about the

approaching aircraft, forcing the team members to rely on visual detection.

The ability of the team members to quickly enter commands to the fire unit display using the attached keyboard was a secondary objective in the evaluation.

The purpose of the experiment was to assess various display characteristics of a surrogate short-range air defense (SHORAD) command and control (C<sup>2</sup>) fire unit system. The findings will go to support the SHORAD C<sup>2</sup> full-scale development program, which will provide automated assistance to SHORAD units in the performance of C<sup>2</sup> functions. The new system will accommodate many functions that are currently performed manually and transmitted by voice radio. (Paige Eversole, Human Engineering Lab)

### Air Defense Prototypes Displayed

The Avenger air defense system shown at the U.S. Marine Corps Show last summer was installed on the rear of a production AM General high-mobility, multipurpose wheeled vehicle chassis rather than the prototype Teledyne Continental Motors, General Products Division, chassis used for firing trials in 1984.

The Avenger completed three test firings at the Yakima Firing Center, Wash., in May 1984. In August, the Avenger was evaluated by the Air Defense Artillery Board, during which 171 of the 178 fixed- and rotary-wing aircraft targets were engaged under day and night conditions.

In 1985, Avenger was fitted with the General Electric GECAL 50 Gatling machine gun mounted under the right Stinger pod. Avenger is normally fitted with two pods of eight Stinger missiles but, according to its developer, Boeing Aerospace, other missiles can be installed, such as laser-directed, wire-guided or infrared-seeking missiles. Yet another alternative is to replace one pod of missiles with a pod of Hydra-70 rockets.

In May 1985, Avenger was installed on the rear unit of the M-973 all-terrain vehicle and was demonstrated at Fort Bliss, Texas.

\* \* \*

Shown for the first time at the 1985 AUSA Show in Washington, D.C., was the private venture Defender II lightweight air defense system, a further development of Defender I — the system proposed to the Army for the pedestal-mounted Stinger.

Defender II has four Stinger missiles, a GE 225 twin 25mm lightweight gun system, passive infrared sensors with a laser rangefinder, digital fire control system, autotracking, base motion stabilization and full 360-degree coverage. It is mounted on the high-mobility, multipurpose wheeled vehicle.

The GE 225 gun fires standard 25mm ammunition already in production for the Bradley Fighting Vehicle and the Marine Corps' LAV-25 armored vehicle.



The Avenger installed on the rear unit of an M-973 all-terrain vehicle at Fort Bliss in early 1985.



The Defender II with a GE 225 gun system and four Stinger missiles in the ready-to-launch position.

# Intelligence

## Vietnam, North Korea Receive MiG-23s



Vietnam has scheduled pilot training on the MiG-23 Flogger in the Soviet Union 18 months earlier than expected. It is now thought that two more squadrons of MiG-23s will be delivered to Vietnam; one will be assigned to the Hanoi area and the other to Ho Chi Minh City.

Meanwhile, Laos is expected to receive another batch of 12 MiG-21 Fishbeds in 1986, supplementing the 19 currently operating.

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In July 1985, Japan's Defense Agency reported that the North Korean air force had received six to eight MiG-23 Floggers from the Soviet Union. The aircraft arrived at Bukchang air base, northeast of Pyongyang. Also reported was the near completion of large-scale construction at the Hwangju air base, south of Pyongyang. It is thought that MiG-23s will be introduced to Hwangju.

In October, a Japanese report claimed that the Soviet Union had delivered a third batch of 10 MiG-23s to North Korea. This increased the total strength of the North Korean MiG-23 force to 26. It was estimated the target figure of 50 aircraft would be reached by the end of 1985.

## Australia Replaces Its Redeyes

The Australian Army is replacing its Redeye missile system with the RBS-70 Armad missile manufactured by Bofors of Sweden.

The RBS-70 is a portable, laser-guided missile system that can engage fighters and helicopters out to a range of 16,000 feet and as high as 9,500

feet. The system, which is equipped with a U.S.-made identification friend or foe system, is in service with the armed forces of Sweden, and several NATO and Southeast Asian countries.

## Chaparral For Taiwan Proposed

The Pentagon has proposed to sell Taiwan 262 Chaparral missiles, 16 launchers with vehicles, training and spare parts for \$94 million.

The missiles "will complement Taiwan's longer-range Nike-Hercules and Improved-Hawk systems by providing for the point defense of critical military targets as a replacement for obsolete M-42 (Duster) gun systems that have reached the end of their service lives," the announcement said.

The Chaparral has already been deployed by the Taiwanese navy. (*Jane's Defence Weekly*)

## Greece Signs Mirage Deal



The first Mirage 2000 aircraft will be delivered to the Greek air force in January 1988. France will begin delivery with one aircraft per month followed by two per month until deliveries are completed in February 1990.

Training of pilots and technicians will begin in May 1988 when four aircraft have been delivered.

(*BlueLine*)

## Soviet Helicopters Better Protected

The Soviets have introduced two changes in their Mi-8 Hip and Mi-24 Hind helicopters to provide protection from heat-seeking missiles. These changes have also been incorporated into the new Mi-28 Havoc.

The engines' exhaust is now shielded by a system (a box with an intake) that takes in cold outside air to mix with the hot turbine exhaust, reducing its temperature. The exhaust is then released

through several slits facing outward (rather than rearward). This distributes it over a wider area and makes it harder for a missile to track. The intake is guarded by a series of rods which blocks the entry of any foreign object, such as a missile.

The second system is an infrared-emitting beacon mounted on top of the aircraft to distract incoming missiles from the engines and cause them to pass over the aircraft or, at worst, hit it in a non-vital area. (F.Y.E.O.)

### India Acquires Soviet Aircraft, Helicopters

The Il-76 Candid, a long-range heavy transport aircraft, has been introduced into the Indian air force, making India the first country in southern Asia to possess this aircraft. The Il-76 will gradually replace the An-12 Cub medium-range transport. The Il-76 can carry troops on two decks and is capable of all-weather missions.

The Indian air force has also acquired Mi-17 Hip helicopters, which are improved versions of the Mi-8 already in service with the force. The Mi-17s are thought to be used to ferry troops and equipment to the snow-bound areas of the Himalayas and eastern Karakorams. (Jane's Defence Weekly)

### East Germany Upgrades Hind

The West German military publication, *Wehrtechnik*, announced in June 1985 that the East German Soviet Mi-24 Hind helicopters are being upgunned and will soon be incorporated in the country's military forces.

The attack helicopter will be equipped with twin over-under cannon fitted with funnel-shaped muzzle brakes. The cannon will replace the quad

12.7mm Gatling-type guns presently mounted in the right rear section of the Hind. The caliber of the new twin cannon is not yet known but is believed to be 23mm.

### New Soviet SAM In Service

The SA-14 Gremlin shoulder-fired surface-to-air missile is now in service and rapidly replacing the SA-7 Grail on a one-for-one basis. The SA-14 is believed to be guided by laser beam, has a range of six to seven kilometers and is fitted with a high-explosive warhead. Its launcher, with the missile's conical nose protruding, easily distinguishes it from the SA-7.

The SA-7 was introduced into the Soviet army in the 1960s and was issued on a large scale to Warsaw Pact members and several other countries. It is also manufactured in China as the Red Tassel and in Egypt as the Sakr Eye. (F.Y.E.O. and Jane's Defence Weekly)

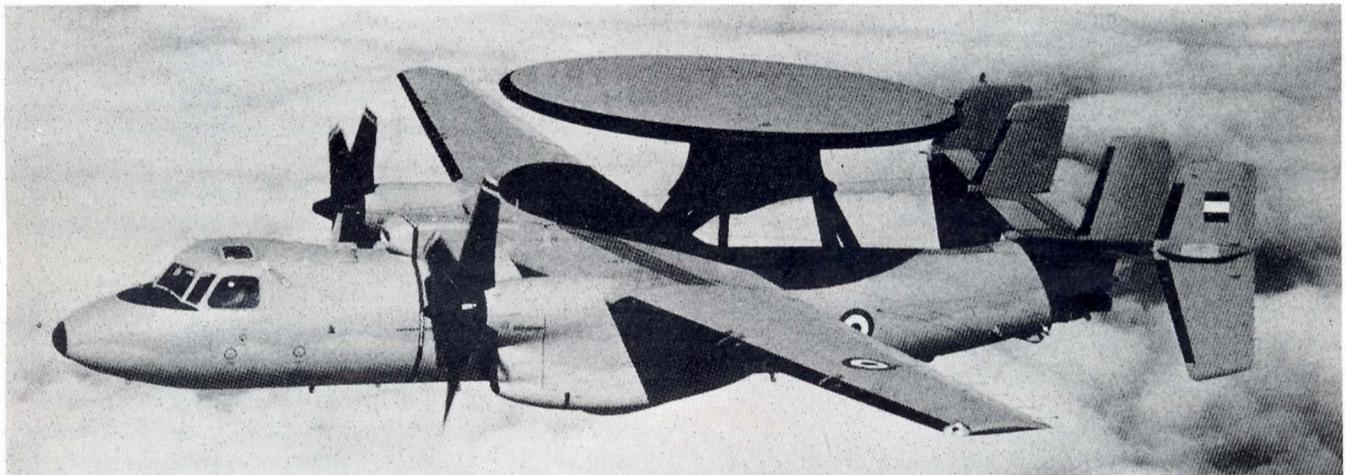
### Malaysia Receives Updated Skyhawks

Malaysia has taken delivery of 20 refurbished U.S. A-4 Skyhawk fighter aircraft, and an additional 20 will be flown in by the end of the year.

Thirty-four of the Skyhawks will have a single-seat A-4 configuration, while the other six aircraft will become two-seat trainers with "stretched" fuselages to accommodate a tandem cockpit and dual flight controls.

The Skyhawks, which are to form two squadrons, will almost double the number of the Royal Malaysian Air Force's first-line combat aircraft. All 40 aircraft will bear the designation PTM (Peculiar to Malaysia). (Jane's Defence Weekly)

### Egypt Receives First E-2C



The Egyptian air force received its first of five E-2C Hawkeye early warning aircraft in October 1985. The contract, valued at more than \$700 million, includes support equipment, spares and con-

tractor services.

The second E-2C is scheduled to be delivered to Egypt in July 1986, and the third, fourth and fifth in March, April and May 1987.

# An Organization For Everyone



Although Air Defense Artillery is a relatively new branch, having been created in 1969, its history and tradition go back to 1775. It's also a branch that is changing rapidly; undergoing one of the most ambitious modernization programs in the Army.

Tying history and tradition with future plans is the Air Defense Artillery Association, created in 1975. Recently, the association has undergone some changes, and its leadership is campaigning to make it a viable source of information, pride and togetherness for members of Air Defense Artillery throughout the world.

According to Col. W.R. Causer, president of the association, the organization, originally under Nonappropriated Fund, is now considered a private organization. The goals of the association, Causer says, are to support the Air Defense Artillery Museum, promote the history and tradition of Air Defense Artillery, build a sense of pride in the branch and direct the activities of the Order of Saint Barbara.

While Causer pays trib-

ute to the work of previous association officers for keeping it alive during its initial stages and during the past several years, he says a massive membership campaign will be conducted to breathe new life into the organization.

But, he admits, the current health of the association is somewhat poor. "There are more than 20,000 active duty members in Air Defense Artillery," he explains, "yet, less than 300 are members of the association." He also says that there is low branch awareness of the association. There are no annual members because no membership drives have been conducted in the past several years, and all programs aside from the museum gift shop are at a standstill.

The courses of action for the association, he says, are to have a massive membership drive, to inform air defense artillery soldiers of the association, to provide individual and unit incentives for joining, to reinstate programs, and to generate new programs.

#### Membership Benefits

Life membership in the

association costs \$30. Life membership in other military branch associations costs from \$150 to \$500. "The Air Defense Artillery Association is the best bargain going for its branch membership," Causer says.

Each life member receives an air defense artillery belt buckle and a second item the individual selects from four choices. "This is a \$15 value gift package for joining," Causer explains. The belt buckle was designed by Col. Robert Matlick.

In addition, the life member receives a quarterly newsletter, the right to participate in association activities and eligibility for various association programs including scholarships. Units, battalion size or larger, will receive a special incentive award for 80-percent unit participation. An engraved silver regimental punch bowl will be presented to the unit, and the unit will be listed on the association's honor roll.

Corporate memberships are also being offered for \$500.

#### Programs

Some programs under consideration by the association are the presentation of a sabre to the West Point graduating cadet and Officer Candidate Course graduate with the highest class standing who select Air Defense Artillery. This also applies to National Guard members. The top ROTC cadets from each of the four ROTC regions who select the branch would also receive a sabre. Furthermore, the presentation of a set of dress blues to the top graduate of selected NCOES courses is being considered. Special recognition awards

are being designed to honor air defense artillery soldiers throughout the year. Scholarships for the children of members are also being considered. The criteria for such scholarships, says Causer, will probably include not only academic standing, but extracurricular activities and family needs as well.

Another program to be conducted by the association is the management of the Order of Saint Barbara. This will include the review and selection of membership in the Order of Saint Barbara. The primary selection criteria is "significant contributions to Air Defense Artillery."

The association plans to work closely with the Air Defense Artillery Museum to support education outreach as well as in-house education programs.

Causer admits that the entire program is "very ambitious" and that "the success of the programs depends upon a successful membership drive."

The Air Defense Artillery Association is for everyone — enlisted and officer alike.

The membership drive is on at Fort Bliss, Texas. Other ADA units will receive letters of instruction and detailed information beginning this month. Personnel not assigned to a TDA or TOE unit may receive membership by writing to: ADA Association (Col. Causer), P.O. Box 6101, Fort Bliss, TX 79916.

# AIR DEFENSE ARTILLERY ASSOCIATION

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