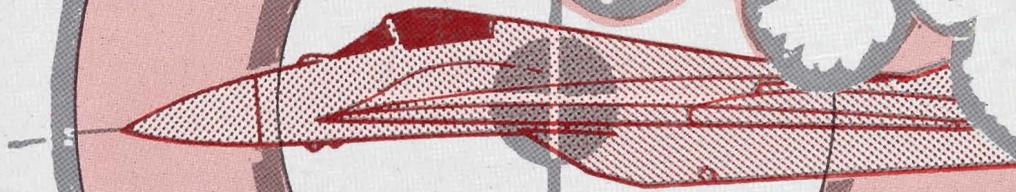


AIR DEFENSE ARTILLERY



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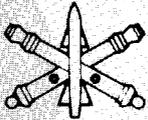
SHOOT-OFF



Army Picks Pedestal-Mounted Stinger Candidates . . . Page 8

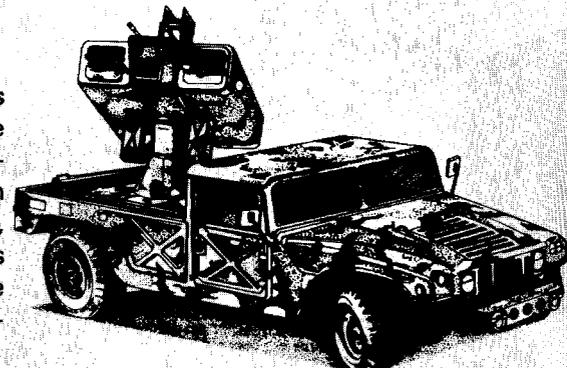
M A G A Z I N E

AIR DEFENSE ARTILLERY



Forward area air defense (FAAD) continues to dominate ADA news and the pages of *Air Defense Artillery*. The names of pedestal-mounted Stinger (PMS) prototypes which will compete to see which will become the FAAD line-of-sight rear component are announced in "Pedestal-Mounted Stinger Candidates Set for Shoot-off" on Page 8. In "Do You Like Video Games? Are You Good?" on Page 9, Capt. James M. McAlister tells how recent basic training graduates were selected to crew PMS prototypes in the upcoming shoot-off. Maj. Michael Howell and

Capt. Steven Peters describe FAAD's command, control and intelligence (C²I) component in "FAAD C²I: Piercing the Fog of Battle," beginning on Page 13. Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, devotes his "Intercept Point" column on Page 3 to an update of FAAD developments.



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F E A T U R E S

Pedestal-Mounted Stinger Candidates Set for Shoot-off . . . 8

Do you like Video Games?

Are You Good? . . . 9

FAAD C²I: Piercing the Fog of Battle . . . 13

Can Corps Chaparral Support Any Contingency? . . . 17

Towed Chaparral . . . 20

Air Defense Korean Style . . . 23

Dien Bien Phu: Counterair

Turns the Tide . . . 25

The First of Air Defense Artillery's Regiments Activated . . . 31

A View From the Field:

ADA Alive and Well . . . 32

U.S. Patriot in Europe . . . 34

New ADA 'Top' Values Taking Care of Troops . . . 37

Solving Software Maintenance Problems . . . 40

The New Look of Hawk . . . 43

Hawk Battalion Tactical Operations

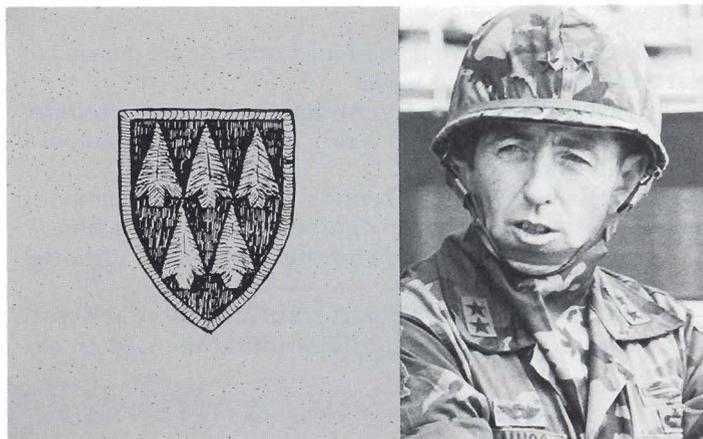
Center: Is More and Fancier

Really Better? . . . 44

Hawk Institutional Training System . . . 48



New ADA 'Top' Values Taking Care of Troops . . . 37



ADA Alive and Well . . . 32

D E P A R T M E N T S

Intercept Point . . . 2

The Open Door . . . 3

Vapor Trails . . . 5

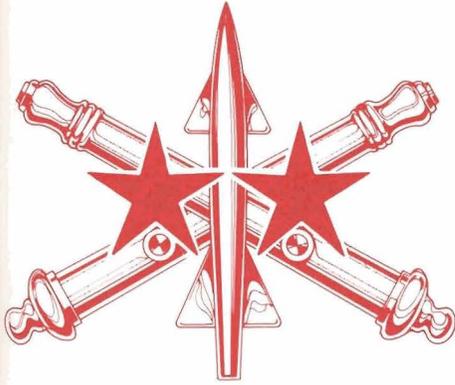
Branch News . . . 50

Scanning . . . 57

Letters . . . 60

F I R S T * T O * F I R E

INTERCEPT POINT



FAAD System Gains Momentum



Maj. Gen. Donald R. Infante

In the Spring 1986 issue of *Air Defense Artillery* magazine, our focus was on the Forward Area Air Defense (FAAD) system. That focus continues in this issue with articles on the pedestal-mounted Stinger shoot-off and FAAD command, control and intelligence (C²I). FAAD, as every red-blooded air defender knows, resulted from the Sergeant York Gun demise. The FAAD System is a system of weapon components that will be deployed primarily on our division battlefield. Working together, they will give the enemy only unattractive attack options.

FAAD contributes to our combined-arms Army mission of preserving the peace four ways:

- by ensuring our Infantry, Armor and Aviation brethren the freedom to maneuver that is essential to success against a numerically superior enemy.
- by protecting our C²I centers so vital to placing the required combat power at the right place at the right time.
- by protecting our division logistical centers so essential to sustaining the war.
- by attriting enemy aircraft transiting to attack rearward airbases and depots, thus alleviating the load on our

rearward air defense.

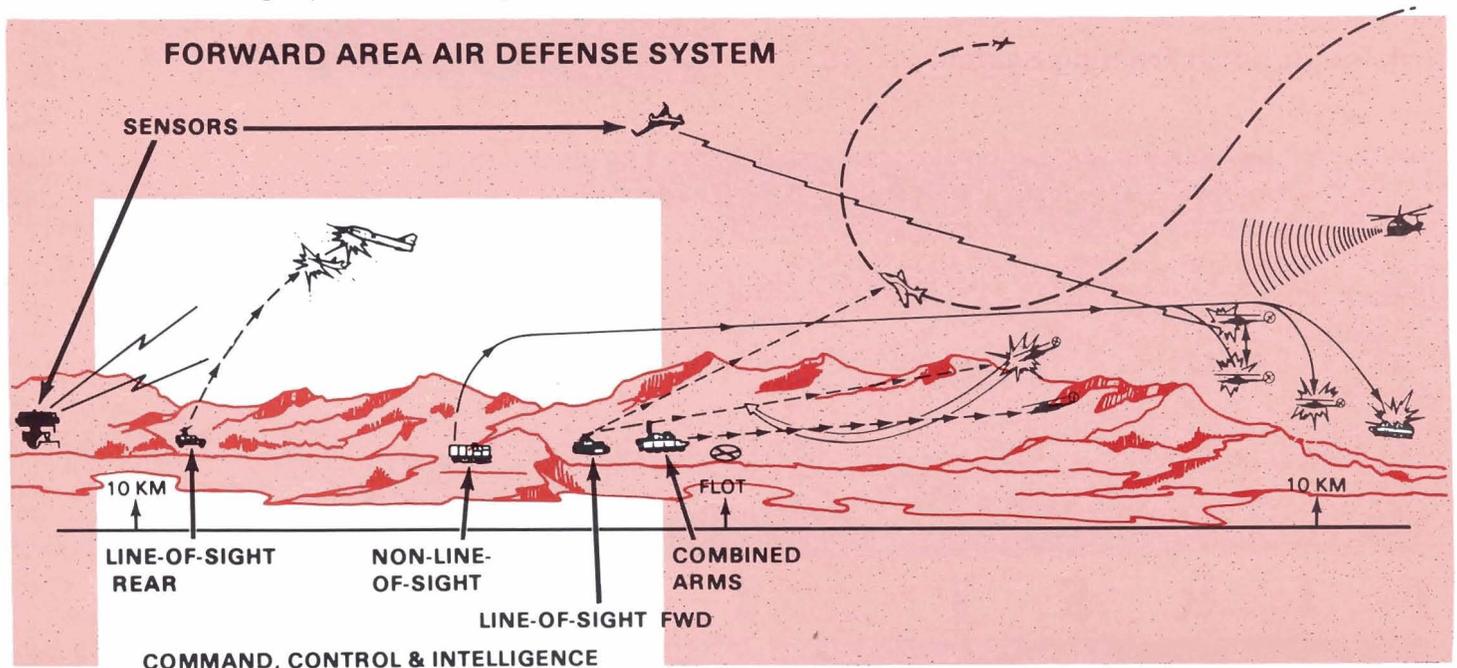
FAAD consists of the following components:

★ Combined Arms. Within their range limitations, our combined-arms brethren must contribute to the defeat of the enemy helicopter threat.

★ Line-of-Sight Forward (LOS-F). The LOS-F component is the Sergeant York replacement. Operating near the forward line of own troops, it adds its fire to that of combined-arms range, but concentrates on engaging enemy aircraft beyond the range of our combined-arms brethren.

★ Non-line-of-Sight (NLOS). NLOS destroys helicopters behind hill masks as well as those deep in enemy territory as they transit to the front. Primary contender is the fiber-optic guided missile (FOG-M) designed by engineers at the U.S. Army Missile Command (MICOM). When no helicopter threat appears, FOG-M kills tanks.

★ Line-of-Sight Rear (LOS-R). Primarily designed to kill fixed-wing aircraft, it usually deploys no further forward than the battalion rear. The near-term, nondevelopmental solution is pedestal-mounted Stinger. Eight Stingers



mounted on a high-mobility, multipurpose, wheeled vehicle, or "Humvee." Comes equipped with a forward-looking infrared radar, laser range finder, passive identification devices and a C²I hook-up. Shoot-off to select a winner begins Oct. 27 (see "Pedestal-Mounted Stinger Candidates Set for Shoot-off," Page 8.)

★ Command, Control and Intelligence. The FAAD C²I component is the combination of hardware and software, and active and passive sensors that draws it all together. We are about to sign a contract to begin the hardware and software integration effort. "Sense-off" to select a new ground sensor scheduled next summer (see "FAAD C²I: Piercing the Fog of Battle," Page 13.)

If you sense progress, you're right. The Army's periodic reviews are important milestones in the development of new weapon systems. On July 22, the Army completed the first FAAD Joint Requirements Board (JRMB) review. The JRMB is a panel of VIPs in the Office of the Secretary of Defense whose names read like a "Who's Who" gathering. Tough, inquisitive, with no drums to beat, they care only about what's best for the country. The Army did a good job at this review. The result is substantial progress, even in an environment of shrinking budgets. Here are the outcomes of the JRMB review:

★ Proceed with full-scale engineering development on FAAD C²I. What this means is we finally sign a contract for automating FAAD C²I — a giant step forward for our Army and Air Defense Artillery.

★ Proceed with the purchase of 17 nondevelopmental item ground sensors. This translates to the first step toward replacing the forward-area alerting radar. A "sense-off" next summer will be the first step. Again, a giant step for the Army.

★ Return to the JRMB this November for an LOS-F (heavy) interim status review. Our discussion will focus on the Army's requirements for this component. Also, we'll present our test plan for the June-September 1987 shoot-off that will

determine the winner from among 27 contractors who have submitted system responses to MICOM.

★ Return in March 1987 for a full JRMB update on the other FAAD components. By then, we will be almost ready to pick a PMS shoot-off winner, and we'll have more details on NLOS acquisition planning.

While we air defenders should be pleased and justly proud of our FAAD accomplishments, we must recognize the debt we owe to those outside the branch who have contributed so much to our success:

★ The Army and its senior leadership remains totally committed to the FAAD program. The Army chief of staff continues to rank FAAD as the Army's No.2 priority, behind only the Bradley. I am a witness to the support the undersecretary of the Army and the Army vice chief of staff gave FAAD as they did battle in our behalf with the JRMB members.

★ The TRADOC-Army Materiel Command teamwork was the best I've ever seen. Brig. Gen. William J. Fiorentino and his team from the MICOM Air Defense Program Management Office were superb. Especially commendable was the performance of Col. Ken Brown, the project manager of air defense command and control.

★ The Army's functional area approach makes infinitely more sense than the "each's" approach of the past. We should never expect one system to win the war. A family of complementary and synergistic components such as those found in FAAD needs to be addressed as a whole, and managed as a whole. For this commonsense management approach, which is a drastic departure for a system that adores micromanagement, we owe "the Under," the Honorable James R. Ambrose.

Much work remains to be done, but FAAD has momentum. We are on the way to meeting the needs of our Army in the forward area air battle.

F i r s t * t o * F i r e

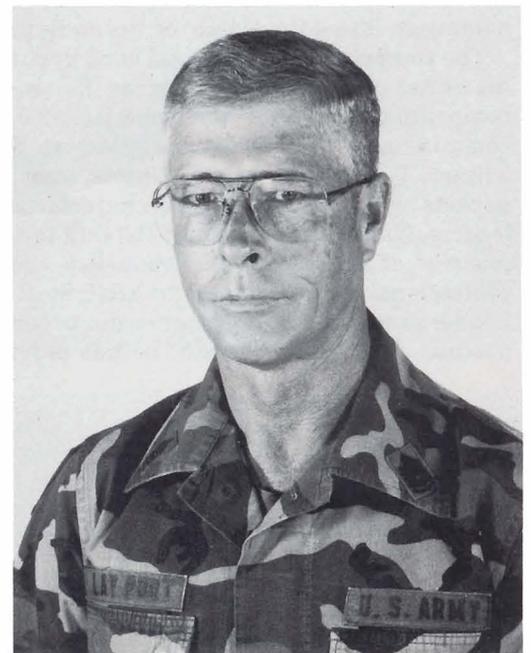
The Open Door

Charismatic Leaders Build Unit Cohesion

Charisma, professional ethics, and superior knowledge or skill are some of the common traits of leaders of cohesive units. "Leadership is probably the most important consideration in building cohesive units, and it requires extended and intensive face-to-face contact between leaders and soldiers," states Wm. Darryl Henderson, in his book *Cohesion, The Human Element In Combat*.

It is not by accident that there is an underlying consistency in the character traits of leaders of units who perform well. Among other things, these leaders possess a degree of charisma, the ability to gracefully and repeatedly survive difficult situations or act to neutralize the effects of failure. The

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charismatic leader will use the perception of outside threat, competition or difficult challenges to mobilize and bring together the unit.

Through professional ethics, charismatic leaders emphasize that all members of their unit, and especially the leader, share equally all hardship and danger.

Another common trait of these unit leaders at squad, platoon and company level is that they are perceived by the group as professionally competent to successfully meet any situation faced by their unit. This professional competence is often called "expert power." In other words, the leader uses his expertise as a source of power and influence within the unit. In hardship situations, and in combat especially, professional expertise that allows the leader to cope successfully with the situation is a significant source of unifying strength.

Lieutenants and captains as well as squad leaders and platoon sergeants — through a system of progressive branch and specialty schools and courses — learn skills that enable them to meet successfully all anticipated situations in combat. The extensive training received by U.S. small-unit leaders places them among the world's most competent military leaders, and gives them ample opportunity to develop their "expert power."

Each year about this time, each battalion or separate unit at Fort Bliss, Texas, is encouraged to search its ranks and files looking for that NCO and officer who best exemplifies those soldierly and leadership traits demonstrated by the late General of the Army Omar N. Bradley. The General of the Army Omar N. Bradley Chapter, Association of the United States Army, established annual awards to be made in General Bradley's name to the officer and NCO who demonstrate by their services expert leadership powers like those of General Bradley.

Each nominee is evaluated on personal and professional qualities and involvement in the community. Commanders prepare narrative evaluations of the nominee. The evaluations assess character, integrity, sense of duty, loyalty, leadership ability, professionalism and expertise. Also judged is the nominee's ability to express himself orally or in writing, military bearing and other outstanding qualities. Professional qualities include MOS-related schooling, leadership, awards, decorations, citations, special assignments and more. Community involvement includes religious or youth activities, sports, PTA and other non-profit organizations helping children, the elderly or the underprivileged.

The competition is fierce and each nominee is a winner in his or her own right and deserves the award. But, as in all competition, only one non-commissioned officer and one commissioned officer will emerge victors. Since each one is a winner, I wanted to share aspects from various nominee packets which exemplify the characteristics of the finest leaders. Notice the consistent striving for expert power, the mention of a charismatic personality and the unswerving professional ethics common to each: Staff Sergeant Soldier Leader is an outstanding non-commissioned officer. In his position as platoon sergeant he has provided an excellent

example of professionalism, integrity and leadership. Because of the rank structure of the soldiers in his organization, SSgt. Leader is often faced with the situation of having soldiers in his platoon who outrank him. Because of his professional approach, demonstrated leadership traits, and loyalty to his subordinates, peers and superiors, he has excelled and succeeded in winning the trust and respect of all the soldiers in his platoon. His dedication to duty surpasses that of his peers. SSgt. Leader expresses himself fluently, with precision and clarity, both orally and in writing. His bearing, knowledge, and willingness to speak out on behalf of his soldiers has earned him the respect of those who work with and for him.

Staff Sergeant Leader has been selected as NCO of the Quarter for both battalion and brigade, has scored perfect on his basic skills test and maintains a score of 300 on his Army physical readiness test. He was also distinguished graduate of the advanced non-commissioned officers course; nuclear, biological and chemical course and primary leadership development course. Staff Sergeant Leader sets high standards for himself and his soldiers both mentally and physically. He not only strives to create an environment conducive to good learning, he creates situations that cause his soldiers to use and improve their leadership skills.

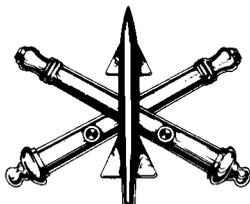
Staff Sergeant Leader and his platoon have taken it upon themselves to get involved in making their unit and the community a better place to live and work by donating their time and money for worthwhile projects. Many hours are used by him and his soldiers taking care of, coordinating and supervising scouts, the elderly and youth activities. He and his wife are both active in their church as Sunday-school teachers, fund raisers and activity coordinators.

Staff Sergeant Leader is currently attending college in pursuit of a master's degree in psychology. He has a master's in business administration.

Staff Sergeant Leader's awards include the Meritorious Service Medal, the Army Commendation Medal with two oak leaf clusters, the Army Achievement Medal with two oak leaf clusters, the Good Conduct Medal (third award), the NCO development ribbon with a number three, the overseas ribbon with a number two, and the national defense service ribbon.

What characterizes the difference from SSgt. Leader and all other "great" NCO leaders in the Army? His natural instinct to give of himself from day one of his arrival to his unit. He strives to meet and learn every one and everything about his unit. This wealth of knowledge was used by him to give new meaning to soldier care.

As Henderson stated, "Armies desiring cohesive units must ensure that unit leaders are professionally trained and prepared. Leaders of front line units must be viewed as 'men of steel' professionally equal to meeting all tasks demanded by the situation." Publically acknowledging these "men of steel," through awards named after our greatest professional military leaders, is only one way to help remind us of how important our small-unit leaders are to the overall cohesiveness of our Army.



1/51 ADA Aims at Hinds While Families Watch

While family members watched, 1st Battalion, 51st Air Defense Artillery, Fort Ord, Calif., devastated enemy aircraft with Stinger and Vulcan weapon systems.

The scene took place recently at Fort Hunter Liggett, Calif., during the unit's annual live-fire exercise.

A new target making an appearance was the pop-up Hind. This gave the Vulcan gunners new experience in engaging targets that unexpectedly pop up. The Hind target simulated a Soviet helicopter unmasking from behind a terrain feature to engage friendly forces. Not only did the

Vulcan gunner have to worry about high-performance threats, he had to be prepared to engage a Hind within 10 seconds of its appearance.

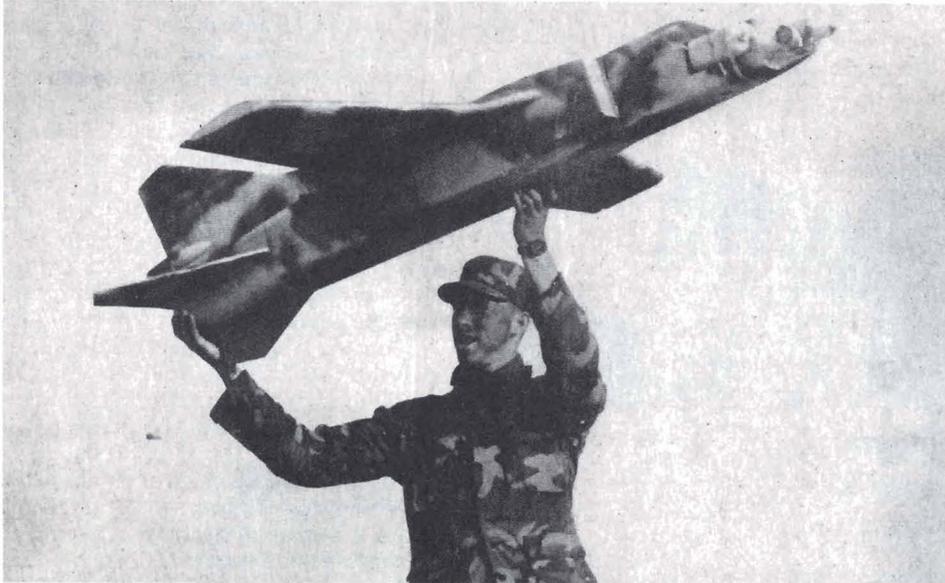
Family members of 1/51 ADA troops were astounded by the brilliant display of fireworks caused by explosions of the Stinger missiles as they hit their targets — the ballistic aerial target systems, which provide an excellent heat source.

Onlookers were also impressed by the display of firepower provided by the Vulcans which spewed 3,000 rounds per minute at their targets.

As soldiers engaged enemy aircraft with missiles and air defense guns, they learned how to better their odds for survival on the modern-day battlefield.

by James Nelson

The 1/51st ADA was redesignated as the 2/62nd ADA in August 1986 (see story Page 31).



Pvt. Charles Smith, HHB, 1/51 ADA, launches a radio-controlled miniature aerial target. (Photo by Rachel Snyder)



PFC Lee Rodriguez, A Battery, 1/51 ADA, follows Cpl. Stephen Browning's instructions for engaging a target. (Photo by Rachel Snyder)

1/3 ADA Shows Its Mettle in Tough Desert Training

During some of the Southwest desert's hottest weeks, air defense artillerymen of 1st Battalion, 3rd Air Defense Artillery, Fort Campbell, Ky., returned to their "desert home" for annual training. The air defenders conducted training at McGregor Range near Fort Bliss, Texas, home of Air Defense Artillery.

The Fort Campbell air defenders are assigned to the 101st Airborne Division (Air Assault) and strategically deployed by rail and air from Kentucky to the aerial gunnery ranges in Texas.

McGregor Range provides the unit with more area for training. SFC Joe Marotta, of the S-3 office, said, "This is great for our soldiers. There is more room and they get better training."

During the training the space at McGregor Range permitted the battalion's units to practice their air assault skills that make the 101st unique. The CH-47 Chinook helicopters were deployed from Kentucky to support the air assault operations. Moving a platoon's worth of equipment such as towed Vulcans, Gamma Goats and 20 or 30 kilometers in less than an hour is routine for 1/3rd ADA.

The battalion also conducted training exercises including Stinger and Redeye standardized crew drills. Each soldier was tested to certify his MOS skills.



A 1/3rd ADA Stinger crew takes aim during desert training. The Fort Campbell, Ky., crew took advantage of Fort Bliss' open spaces for their training. (Photo by Mary Shore)

The highlight of the range week for the Stinger and Vulcan gunners alike was the live-fire exercise. The battalion fired three Stinger rounds and eight Redeye rounds, scoring nine hits with 11 missiles. Fifty-three Vulcan gunners also qualified in aerial and ground target gunnery, firing more than 60,000 rounds of ammunition in two days.

Sp4 Mark Apodaca, a gunner, said, "I like what I'm doing. It's exciting and it's always different." by Pam Glascock

Target Miss Indicator Tells Gunners of Hit or Miss

The Redeye gunners of 4th Battalion, 61st Air Defense Artillery, Fort Carson, Colo., were given more definite information on their shooting ability against flying targets.

The ballistic aerial targets (BATs) poised with cones pointed skyward, ready to leap into the air to try to outrun a Redeye missile, were different from BATs of years past. This year a

miss indicator device was attached to the BAT to give accurate readings of tactical kills on the proximity detonation. In the past it was strictly a visual observer's determination.

A Redeye crew consists of a crew leader and a gunner. These air defense artillery crews have an M-151 jeep with a trailer to haul their combat load of six Redeye missiles into battle.

The annual service practice began with a real sense of exhilaration as the countdown proceeded and a BAT screamed skyward. The gunner had to acquire the target in the sight reticle which gave him an on-target tone. He then superelevated the Redeye and fired. When the smoke cleared, the gunner watched the missile accelerate toward the target. The missile can detonate by one of three methods: impact on target, detonation by proximity fuse, or time delay if the target is missed.

During the annual service practice this year, the Redeye crews scored nine direct hits on the BATs.

by MSgt. Terry Traylor



PFC Terry Crook tracks a practice target with a Redeye trainer while his firing coach, Sgt. Bobby Young, looks on. (Photo by MSgt. Terry Traylor)

4/61 ADA Soldier Gains 'Bragging Rights'

The Soviet MiG-27 fighter streaked over a heavily fortified combat position held by Fort Carson, Colo., fighting elements.

Task force soldiers manned Vulcans. Expertly, a gunner of the 4th Battalion, 61st Air Defense Artillery, scored a direct hit on the jet's engine compartment. The impact from the Vulcan's 20mm cannon projectile caused the jet to scatter into pieces and swirl downward.

A Vulcan senior gunner, Sp4 Andrew Abeyta, said, "I've been assigned to the 4/61st ADA for almost three years and only knocked three of them out of the sky. When I blasted that target into pieces, it was the result of my Vulcan crew coming together."

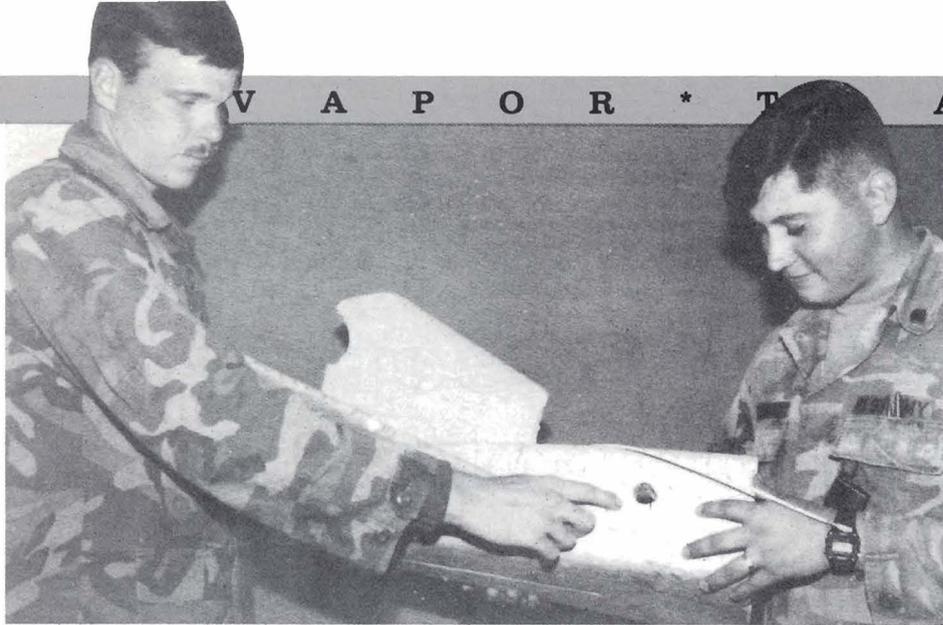
The MiG-27 jet was actually a radio-controlled miniature aerial target, but because of its size, the target looks like a real jet flying at a great distance.

Sp4 Jeff Gibala is a Vulcan senior gunner who shot down his first target during this downrange exercise. "When I first got here, all I heard was that hardly anyone could shoot one down. I asked my cadre to give me a try. I was sure I could blast it out of the sky. On the firing line, my Vulcan crew told me whether I shot too high or low. The smoke was thick around the 20mm cannon, so it was hard to see. By watching the tracers and listening to my assistants, I was able to score the hit," he said.

Gibala said that a lot of competition exists among air defense artillerymen when it comes to destroying a target. "Shooting one down gives me bragging rights in my unit. There's always a lot of talk about which gunner is best. I know I won the bet and feel proud of myself."

The task force's air defense officer was 1st Lt. Martin Remillard. He said that the ADA units undergo Vulcan training quarterly. He added that Vulcan crewmen work with tank-heavy units as often as possible. "The 4/61st's wartime mission is to support forward units by defending against low-flying aircraft, while closely coordinating with tank companies. When a troop shoots a target down, it gives the entire Vulcan crew more faith in their system. They aren't shot down very often. It is so hard because gunners must hit the engine or antenna to bring it down. If not, it has a good chance of staying up. Thus the reason for a large mass of fire," Remillard said.

Abeyta pointed out that his platoon shared the hit, and Gibala said the hit



Sp4 Andrew Abeyta, right, holds the target he blasted out of the sky while Sp4 Jeff Gibala checks the damage. (Photo by Randy Schaefer)

was the result of how well his crew knows the Vulcan system.

by Randy Schaefer

1/65 ADA Air Defender Earns His Authority

Sp4 Jonathan Payne has proven to be an excellent leader in today's Army and was recognized as such in his post newspaper's column called "Leader Profile." He earned the authority of buck sergeant while serving with B Battery, 1st Battalion, 65th Air Defense Artillery, Fort Bliss, Texas.

Acting Sergeant Payne immediately assumed the position of section chief in the absence of Sgt. Kenneth Wilder. As

section chief, he instructs and talks with his subordinates about what it takes to become an outstanding 16D, Hawk missile crew member.

"Since entrusted with the rank of sergeant, Jonathan Payne efficiently and productively performed the functions of a non-commissioned officer," stated his first sergeant.

During a live-fire exercise, Payne supervised a live missile disarming procedure wearing full chemical gear and demonstrated the experience of his previous training in Europe.

He also maintains a discreet military bearing. He stays physically fit and his open-minded attitude has brought him respect from his peers as well as his subordinates.



Sp4 Jonathan Payne, left, instructs one of his crew members on the proper method of strapping down a Hawk missile.

Charging Charlie's Dancing to a New Beat

A unit's new physical training program is said to be able to "knock your socks off." Charlie Company, 11th Air Defense Signal Battalion, has been trying a new approach to company fitness.

Instead of the regular physical fitness training formation on the parade field, this 32nd Army Air Defense Command unit falls into the exercise room of the *kaserne* gym to follow the cadence of an aerobics instructor.

Sp4 Melody Y.T. Sadarangani is a certified aerobics instructor. Her approach to PT has so motivated the soldiers that they chose aerobics over regular Army PT.

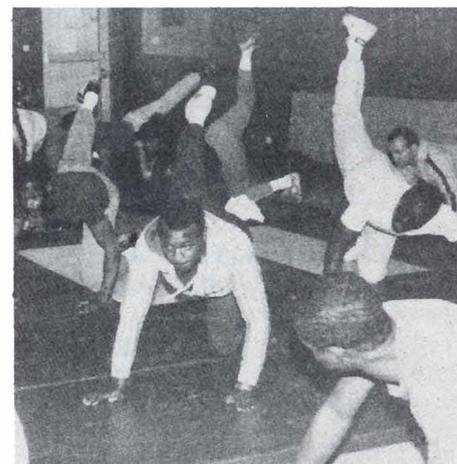
There are plenty of benefits to the aerobics program. It not only enhances muscle and joint flexibility, but it also tones muscles, strengthens the cardiovascular system, increases the circulatory system capacity and, according to Sadarangani, it gives soldiers a positive psychological feeling.

Aerobics provide a means to work the body in various positions which normally aren't used except in manual labor jobs. Sadarangani said that when aerobic exercises are aggressively pursued, they work the body more effectively than a day of manual labor.

The workout that Charlie soldiers get is not considered an easy one. Most of the soldiers are under 27 years old and in good physical condition.

Exercising to music has the company bebopping in cadence. Soldiers seem to have accepted the new exercise program and are striving to make the training even better.

by 2nd Lt. John E. Ruhl



Soldiers of the 11th Air Defense Signal Battalion kick their legs up during aerobics PT. (Photo by SSgt. Susan Durban)

And in this corner . . .

Pedestal-Mounted Stinger Candidates Set for Shoot-off

Three pedestal-mounted Stinger prototypes will compete this winter in a high-stakes shoot-off to determine which system will become the forward area air defense (FAAD) line-of-sight rear component. The three systems are Boeing Aerospace's Avenger, LTV's Crossbow (formerly called the Setter) and an unnamed General Dynamics prototype.

Each of the three pedestal-mounted Stinger (PMS) prototypes feature Stinger missiles plus a gun system mounted on a highly mobile, multipurpose, wheeled vehicle called the "Humvee." A fire control system with an integrated weapons display coordinates PMS firepower.

The Army, which has earmarked \$1.4 billion for the purchase of PMS systems and Stinger missiles, released the names of the candidates in September.

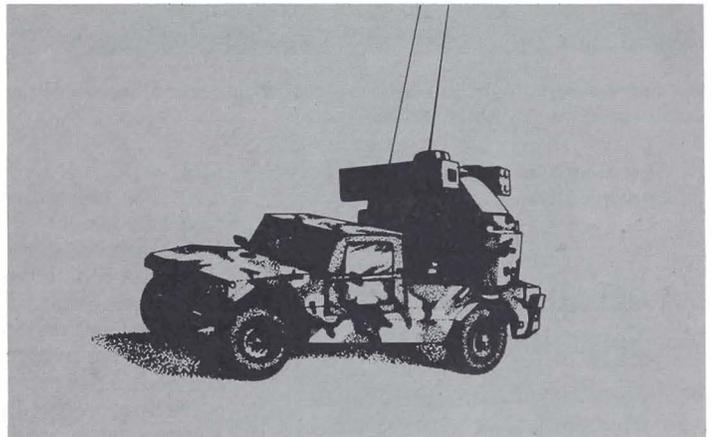
Air Defense Artillery player personnel will participate in three phases of the PMS shoot-off. Phase I, an initial training period designed to sharpen the common skills of ADA soldiers picked to crew the prototypes, is already underway at Fort Bliss, Texas. Contractors will train the crews on the equipment during Phase II, Sept. 27 to Oct. 27. Phase III, the operational and technical portion of the PMS shoot-off, will begin Oct. 27 with climatic tests scheduled for late February through mid-March 1987.

As the FAAD line-of-sight rear system, PMS is one of five FAAD system components. The other components are the non-line-of-sight component (possibly the FOG-M, a fiber optic guided missile), the line-of-sight forward component (the direct replacement for the Sergeant York Gun), an array of sophisticated C²I equipment (once known as SHORAD C²I) that will link the FAAD components together, and combined arms weapons with a self-defense capability against air attack.

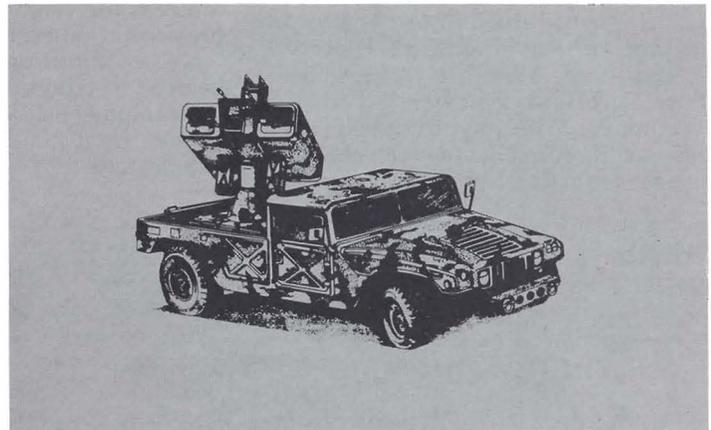
The winner of the PMS shoot-off will largely replace manportable Stinger, becoming the most proliferated ADA weapon system on the battlefield. Most of today's manportable Stinger team members will become PMS crewmen.

"Work on the line-of-sight rear component is proceeding smoothly," said Deputy FAAD TRADOC System Manager Lt. Col. Vince Tedesco. "The contractors have produced promising PMS prototypes. Two have been demonstrated at Fort Lewis. The Army should have an excellent weapon system no matter which system wins the competition.

"The line-of-sight rear component represents a large chunk of Air Defense Artillery's future, and the future isn't far away. We hope to field the first pedestal-mounted Stinger systems by FY 1988," he added.



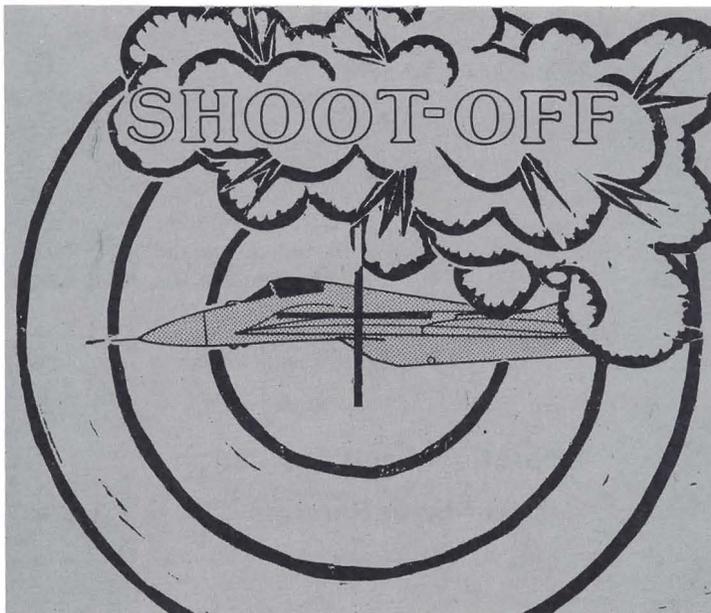
Boeing Aerospace's Avenger



General Dynamics' prototype



LTV's Crossbow



Do You Like Video Games? Are You Good?

Combined test scores and interviews win OSUT graduates coveted spots on pedestal-mounted Stinger test crews

by Capt. James M. McAlister

When the M-1 Abrams tank was still in development, an Army study group warned that, unless soldiers could be trained to operate it with skill and efficiency, the new high-tech battle tank would be no more effective than a big rock of equal size. The same is true of pedestal-mounted Stinger (PMS).

The PMS candidate system test will examine more than the firepower and mobility of prototype systems. It will also determine whether or not typical ADA soldiers can be trained to operate the candidate systems. This makes the soldiers who crew the prototypes during the test every bit as important as the hardware, for their performances will have far-reaching and long-lasting effects. The PMS candidate that emerges victorious from the shoot-off will become the forward area air defense (FAAD) line-of-sight rear component, and most manportable Stinger team members will eventually become PMS crewmen.

A platoon leader, platoon sergeant, four squad leaders and 20 crewmen were chosen to crew the PMS prototypes. The officer and NCOs were selected from Fort Bliss Training and Doctrine Command (TRADOC) units. The 20 crewmen were chosen straight out of basic and 16S (Stinger) advanced individual training. Delta Battery, 4th Air Defense Artillery (OSUT), supplied 15 crewmen while Echo Battery, 4th Air Defense Artillery (OSUT), produced five crewmen. The test platoon was assigned to C Battery of the School Support Battalion, The School Brigade.

The test design plan specified test crews with limited Stinger experience to validate the test premise that 16S crews should be able to effectively operate the PMS. One-station unit training, it was decided, would best represent the Stinger-trained soldier uncorrupted by variances in assignments. The FAAD TRADOC System Management Office, Fort Bliss, assisted by battery commanders and

drill sergeants, screened 201 files and analyzed Armed Services Vocational Aptitude Battery (ASVAB) scores to produce a pool of candidates. The selection criteria was rigid and the interview process was exhaustive. Only bachelors were selected for consideration. The FAAD TSM Office briefed the candidates on the system prototypes and told them what hardships to expect if selected — long hours, exhaustive training, intense pressure and no leave until the end of the test. Each candidate was interviewed separately. Some questions were designed to determine aptitude: "Do you like video games? Are you good at them?" Some questions were technical: "What are the different mode tones of the Stinger IFF?" "What is the maximum number of days the IFF interrogator can be programmed for?"

The interviewers tried to determine each candidate's degree of motivation: "Why did you join the Army?" "How would you like to train on an entirely new weapon system?" The interviewers were impressed with the candidates and their answers. The soldiers understood the importance of the new system and appreciated the challenges and opportunities that awaited them. They were highly motivated toward personal achievement. They were determined to be the best they could be. Even the soldiers who admitted that their primary reason for joining the Army was to finance a college education were eager to be accepted into the test program. "Don't leave me out!" one pleaded.

The 20 selected candidates were given 10 days of graduation leave and reported to Fort Bliss for in-processing into the test platoon in early August. The soldiers were assigned to squads in such a way that no squad possessed a statistical advantage over another.



1st Lt. Christopher Mitchell
Platoon Leader
New Braunfels, Texas



SFC Howard Dailey
Platoon Sergeant
Manchester, Vt.



1st Squad

SSgt. Douglas West
1st Squad Leader
Pensacola, Fla

PMS

Operational and Evaluation Test Player Personnel



2nd Squad

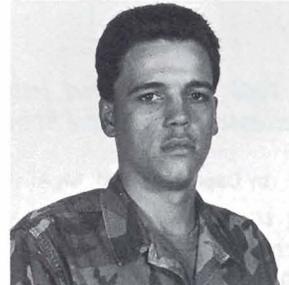
Sgt. Darl Brooks
2nd Squad Leader
Newark, N.J.



Pvt. Karl Wayne Ballantine
Crewman
Fort Myers, Va.



Pvt. Everett Leon Hovencamp
Crewman
Wytheville, Va.



Pvt. Mark Anthony Smith
Crewman
Phoenix, Ariz.



Pvt. Kenneth Gayle Fuqua Jr.
Crewman
Ormond Beach, Fla.



Pvt. Bradley James Burnett
Crewman
Miami, Fla.



Pvt. Gilbert Montano
Crewman
Santurce, Puerto Rico



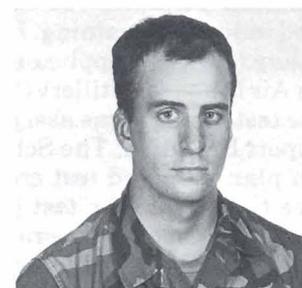
Pvt. Steven B. Gunter
Crewman
Clovis, N. M.



Pvt. Peter J. O'Neill
Crewman
Lemont, Ill.



Pvt. Robert Alan Rosenberg
Crewman
Indianapolis, Ind.



Pvt. Charles Kenneth Shaffer Jr.
Crewman
Canfield, Ohio



3rd Squad

Sgt William Williams
3rd Squad Leader
Spencer, N.C.



4th Squad

Sgt. Gerald Norris
4th Squad Leader
Edington, Va.



Pvt. John Duggan
Crewman
San Bernadino, Calif.



Pvt. Jerome Charles Heslop
Crewman
Campo, Calif.



Pvt. Daniel R. Barren
Crewman
Buffalo, N. Y.



Pvt. Howard Henderson
Crewman
Brookhaven, Miss.



Pvt. Richard L. McNally Jr.
Crewman
Bonaire, Ga.



Pvt. Anthony Rodriguez
Crewman
Brooklyn, N. Y.



Pvt. Jose Martinez
Crewman
Hatillo, Puerto Rico



Pvt. Donald Howard StClair
Crewman
Topeka, Kan.

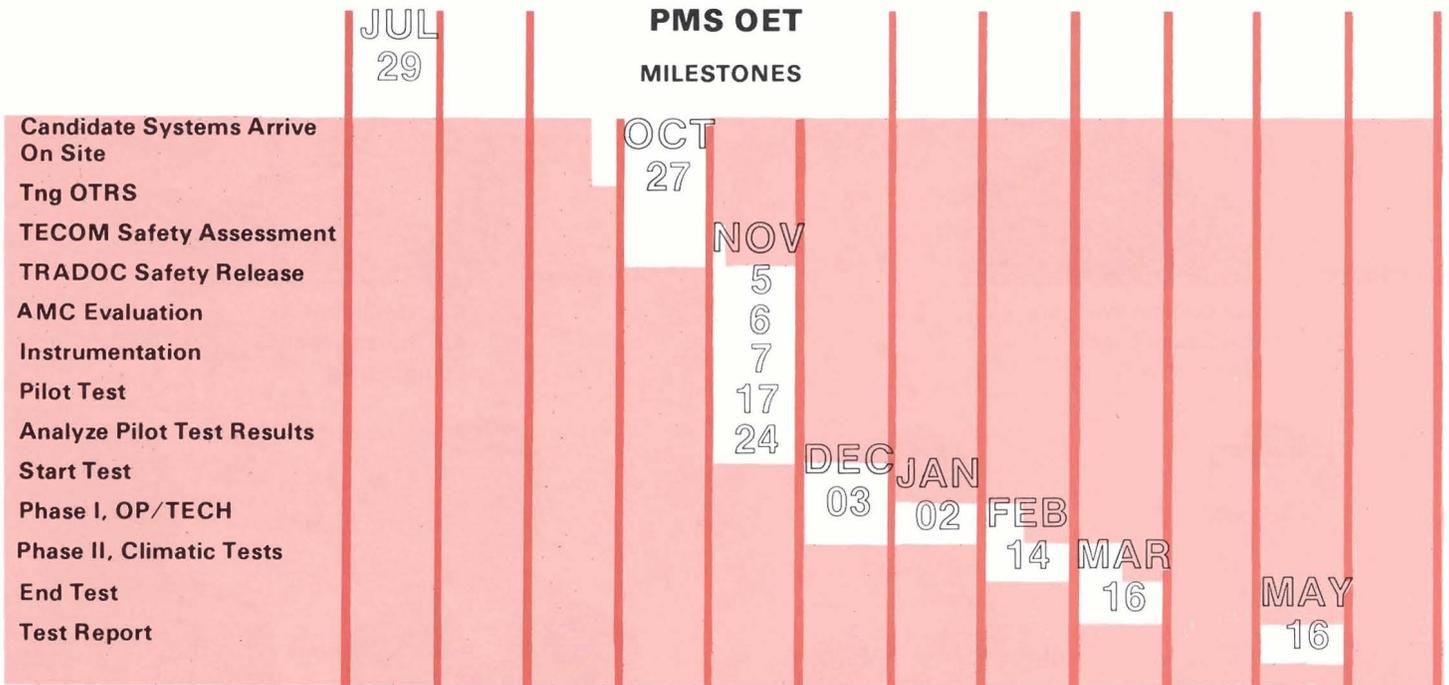


Pvt. Michael Edwin Keefner
Crewman
Mesquite, Texas



Pvt. Karl Ken Willis
Crewman
Kokomo, Ind.

“This platoon must be the best-trained 16S platoon in the Army.” — Maj. Gen. Donald R. Infante



During Phase I of player personnel training, which began Aug. 12, the crewmen were trained and licensed on the highly mobile, multipurpose, wheeled vehicle, or "Humvee." They also received refresher training in common soldier skills, including tracking aircraft with the Stinger tracking head trainer, visual aircraft recognition, communications, and land and road navigation. They also practiced with the .50-caliber machine gun to prepare themselves to operate the PMS' secondary armament.

At the end of Phase I training, one squad will be designated to serve as the manportable Stinger baseline crew during the shoot-off and will continue to train at Fort Bliss during Phase II. The names of the other three squads will be placed in a hat, and contractors will randomly draw the name of a squad to represent their prototype during the shoot-off. During Phase II, these three squads will travel TDY to the contractor sites for training on the prototype system they will operate during the operational and technical portion of the shoot-off, Dec. 3 through March 16, 1987.

The members of the PMS platoon will be the first to put a major FAAD component through an operational and evaluation test.

As the PMS platoon leader, 1st Lt. Christopher Mitchell will monitor training at all three contractor sites during Phase II of the PMS shoot-off. Midway through Phase I training, Mitchell expressed optimism for the new system prototypes and confidence in the soldiers who will crew them.

"I've talked to people who have seen the PMS portion of the solution to the whole FAAD problem in action — people who have actually seen the PMS prototypes fire. They were impressed," Mitchell said. "I have a lot of confidence in the Stinger system itself. Pedestal-mounted Stinger's fire control system is designed to eliminate some of the human error, and eliminating the human error can only make Stinger more effective.

"The guys want PMS to succeed as badly as anyone higher up the chain of command, but the test will show whether or not PMS can outperform manportable Stinger. The squad assigned manportable Stingers during the test will be just as important as the squads chosen to crew the

PMS prototypes. At the moment, they are excited about the chance to become Fort Bliss' only experts on the Humvee. They'll be the first. They are sort of like kids at Christmastime. The guys are happier when we're training than when we're not. They are young soldiers at the very beginning of their Army careers. They want to make a good start," he said.

Sergeant First Class Howard Dailey, the PMS platoon sergeant, said the Army's determination to field the first major FAAD component as swiftly as possible is reflected by the intensity of PMS training.

"Things are moving extremely fast," Dailey said. "There hasn't been much lead time at all. We've just completed the classroom portion of Humvee training, and we've just received two brand-new Humvees. They are being 'deprocessed' at the motor pool this morning, and we're going to start driving them this afternoon.

"Our job is to provide capable crews to the PMS contractors and a good manportable Stinger team," the 14-year veteran said. "We've selected good people. They are well-motivated, fired-up and ready to get started. They'll do a good job."

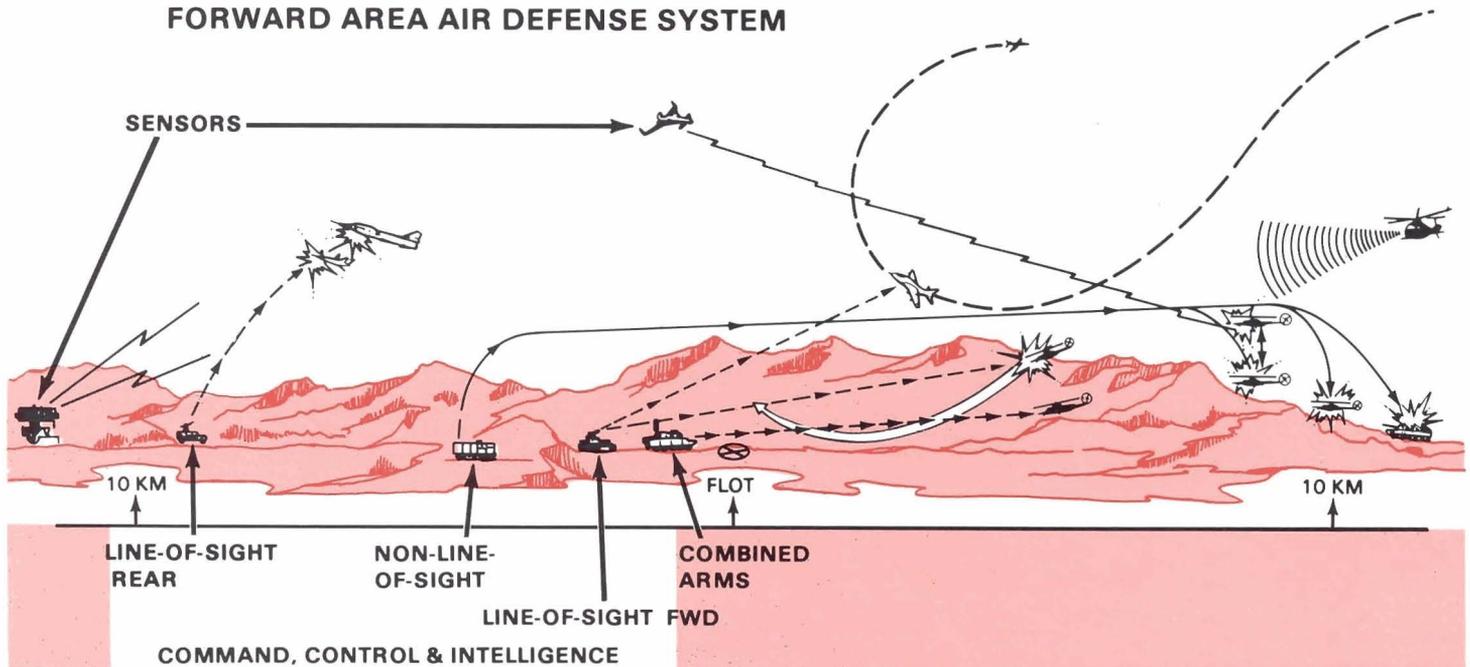
Once the test is complete, the platoon leader, platoon sergeant and squad leaders will be retained with The School Brigade, U.S. Army Air defense Artillery School, at Fort Bliss. They will help Air Defense Artillery planners formulate PMS doctrine and develop training packages. Eventually, this cadre will form the core for the formation of the PMS force.

The 20 crewmembers will be reassigned to designated CONUS units. The four squads will take with them a rare expertise that should put them on the fast track for promotion once the PMS batteries are fielded. The crews of all four squads will have merited a sense of accomplishment that should last throughout their careers — they will have made a significant contribution to the Army and will have become a part of ADA history.

Capt. James M. McAlister is the pedestal-mounted Stinger manpower, personnel, training and documentation officer for the Forward Area Air Defense TRADOC System Management Office, Fort Bliss, Texas.

FAAD C²I: Piercing the Fog of Battle

FORWARD AREA AIR DEFENSE SYSTEM



Forward area air defense (FAAD) command, control and intelligence (C²I) has been called the “glue” that binds the components of the FAAD System together. As with other command, control, communications and intelligence (C³I) systems, it does not constitute firepower in the traditional sense. But because C³I systems pierce the fog of battle, they are leverage tools providing battle captains with a great potential for more effective management and, thus, more effective execution of combat operations.

by Maj. Michael Howell and Capt. Steven Peters

To perform its mission of unifying the division counter-air effort, FAAD C²I must integrate three command and control tasks: force C², operations C², and targeting C².

First, FAAD C²I must integrate the ADA force with the maneuver commander. FAAD C²I, in accordance with the Army tactical command and control system (ATCCS) concept, is the functional ADA control system at corps, division and brigade. The sharing of information through this decentralized architecture allows the ADA commander to organize his forces and assign tactical missions which are complementary to the force commander’s concept of the operation.

Second, FAAD C²I must provide the ADA commander with information about the status, location and posture of subordinate elements so he can properly support and sustain their efforts. This capability and integration with ATCCS ensure that scarce FAAD elements are in the right place at the right time to provide freedom of maneuver and action to the force commander.

Third, FAAD C²I must fuse intelligence and targeting information from organic and external sources for distribution along with weapons control orders to FAAD com-

mand elements and weapons. This task is unique to Air Defense Artillery and is the most challenging of the three C² tasks because of accuracy and timeliness requirements. The FAAD C²I system must establish interoperability with allied, joint, and high- to medium-altitude air defense (HIMAD) C² systems to provide the current air situation picture to FAAD units, combined arms commanders and Army airspace command and control (A²C²) elements. It must also alert FAAD, combined arms, joint, and HIMAD elements to low-level air threats while cueing FAAD weapons and, potentially, combined arms weapons to hostile targets.

FAAD C²I Subsystems

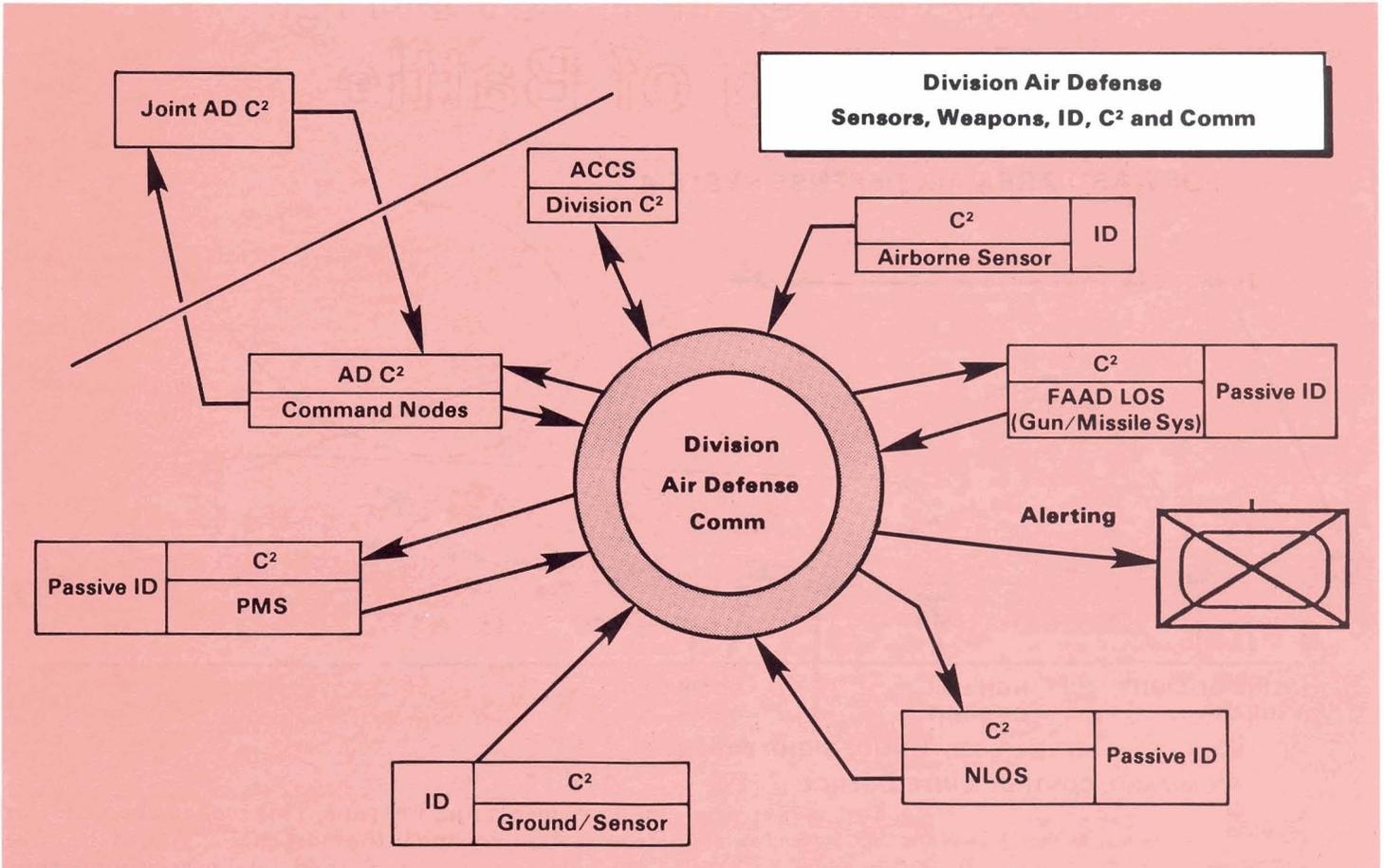
The FAAD C²I system, as approved July 29 by the Joint Requirements and Management Board of the Office of the Secretary of Defense, consists of command and control devices, surveillance sensors and aircraft identification devices.

The recent Joint Requirements and Management Board decision authorizes the Army to procure ground-based sensors and to develop computer software to drive the system. Subsequent reviews are expected to authorize the development of aerial sensors and target recognition devices.

To develop current air situations, FAAD C²I integrates an organic suite of active and passive, aerial and ground-based sensors. These sensors provide surveillance coverage to detect, identify and track air platforms over the division area of influence and extending forward of the FLOT. Platforms of interest include manned fixed-wing aircraft; moving and hovering, rotary wing aircraft; and low, radar cross-section platforms such as unmanned, aerial vehicles (UAVs) and remotely piloted vehicles (RPVs).

An aerial sensor is required to detect and track threat

Forward Area Air Defense Architecture



helicopters operating in clutter and behind masking terrain forward of the FLOT. This capability is critical for effective employment of the FAAD non-line-of-sight component. The coverage also supports the targeting needs of the line-of-sight forward component. The material solution to the aerial sensor requirement is not defined. Concept exploration will be initiated in FY 1987.

FAAD's Active and Passive Sensors

Ground-based, active sensors will be employed in FAAD C²I to provide detection and tracking of fixed-wing aircraft, hovering and moving helicopters, and UAVs and RPVs over the division area of influence. Each of these sensor subsystems will consist of an active radar to which a cooperative identification, friend or foe (IFF) device and a non-cooperative target recognition (NCTR) device will be integrated. The ground-based sensors will internally correlate the IFF and NCTR responses with sensor returns. Thus, the track data message output by the sensor will contain track identification if established.

The NCTR device inherently provides a passive acquisition capability. This capability will be exploited for emission control and survivability by allowing the radar to be non-radiating. The FAAD C²I sensor C² subsystem also provides additional identification capabilities. Hostile identification can be added and confirmed by correlation of a sensor track with intelligence information or air tracks developed in the area air defense joint tactical information distribution system (JTIDS) net. Friendly identification can be added and confirmed by correlating

sensor tracks with JTIDS precise position location information from selected U.S. Air Force aircraft or enhanced position location reporting system (EPLRS) reports from Army helicopters equipped with EPLRS.

Additional information can be developed by implementing at the battalion air battle management operations center (ABMOC) a Patriot-style computer algorithm based on procedural compliance with the A²C² measures.

The NCTR devices will also be integrated into the fire control system of each of the FAAD weapon components. These NCTR devices provide the fire unit with hostile identification confirmation prior to their bringing "steel on target." This confirmation is essential because it will allow FAAD units to exploit the beyond visual identification range capability of FAAD weapons. The FAAD C²I system will provide the means to relay the identification to other FAAD elements.

FAAD Operation by Echelon

The FAAD System is sometimes compared to an aircraft carrier. The FAAD components fit together in a complementary fashion to produce a combat capability that exceeds the sum total of the individual pieces.

The operational concept of echelons within the FAAD battalion, which will be equipped with and make use of FAAD C²I subsystems is described below.

ABMOC

An ABMOC is established at the FAAD battalion TOC headquarters. The ABMOC monitors status and controls organic and attached air defense weapons and sensors primarily through the exchange of information and commands with subordinate battery command posts. The

ABMOC is also the primary interface with joint air defense C² systems and the other functional areas of ATCCS at the divisional level.

The division area of influence is displayed at the ABMOC. This allows the air defense commander and his staff to employ subordinate weapons and sensors and alert supported units. The ABMOC receives positional information from aircraft equipped with EPLRS and JTIDS. It receives track reports from adjacent ABMOCs, the FAAD C²I sensors and the area air defense JTIDS net. The information is integrated to develop the division air picture.

The air situation displayed at the ABMOC is complemented by the display of ground-situation information. This may include the locations of subordinate air defense elements obtained from EPLRS position location reports and the location and types of defended assets. The display may also include types of control measures in effect and force integration data received from other ATCCS functional areas.

Airspace Management Element Liaison Officer

The airspace management element (AME) liaison officer (LNO) section is collocated with the division tactical operation center and serves as the ADA element of the G-3 Air's A²C² section. The AME LNO subsystem provides a current "air battle situation" display for the resolution of A²C² conflicts, coordination of division and joint airspace control measures, and allocation of division aviation assets to the counterair fight. The AME LNO subsystem provides continuity of operations for the ABMOC when the ABMOC is out of action or moving.

Battery Command Post

A command post at the battery headquarters monitors and controls the tactical operations of subordinate command posts and weapons. The battery command post receives air track data via the EPLRS from local FAAD C²I sensor subsystems. It exchanges commands and information with its subordinates and with the ABMOC. The air battle situation is displayed at the command post to enable the battery commander and his staff to perform command functions. The information displayed includes the air picture, ground situation and status of subordinates. The battery command post integrates ADA operations with the maneuver force by interfacing with ATCCS at the brigade level.

Platoon or Section Command Post

A command post at each weapon platoon and section monitors and controls the tactical operations of subordinate weapons. The platoon or section command post exchanges commands and information with its subordinates and its controlling battery command post. Air battle situation information is displayed at the command post for command functions. The information displayed is similar to that of the battery command post but is tailored to the area of interest and tactical mission.

Fire Units

Each FAAD fire unit receives commands and information via the EPLRS from its controlling battery, platoon or section command posts and, in return, provides status information. Each fire unit receives air tracks from local FAAD C²I sensor subsystems and filters these tracks for its area of interest to obtain necessary alerting, cueing and

identification information. The command post relays what position to occupy, the primary target line, readiness posture and weapon control status. These commands and other information are displayed by the fire unit FAAD C²I subsystem. Acknowledgments are provided to the controlling command post via data link.

Air Picture Generation and Dissemination

There are three nets involved in generating and disseminating air track information: the joint area air defense JTIDS net, the FAAD battalion JTIDS net and the FAAD battalion EPLRS nets. Elements operating in the joint area air defense JTIDS net may include, but are not limited to, Air Force, Marine Corps and Navy command and control systems, Patriot, Hawk and the ABMOC. These elements receive tracks from one another and transmit tracks for which they have reporting responsibility. Reporting responsibility is determined by automatically assigning responsibility for reporting a track on the net to the element that has the highest quality track data. This allows a single track to be reported on the net only once from the best source of track data.

Elements operating in the FAAD battalion JTIDS net include the ABMOC, AME LNO and the FAAD C²I sensors. These elements also receive tracks from one another and transmit tracks to form a composite air picture. The EPLRS net includes all FAAD C²I subsystems. The correlated air picture is provided to the EPLRS nets and each subsystem monitors only that area which represents its area of interest.

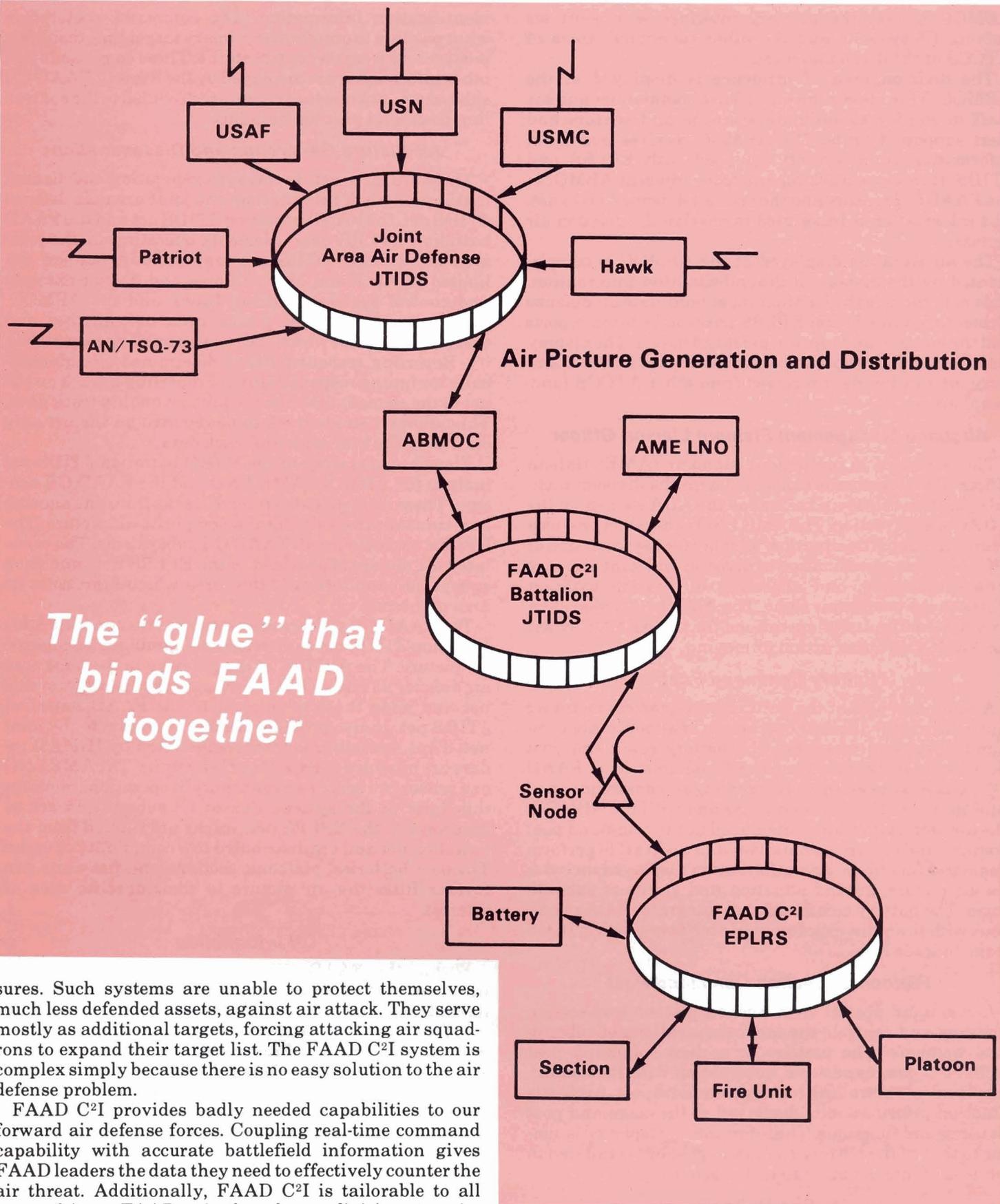
The FAAD C²I sensors are netted together on the FAAD battalion JTIDS net to develop an unambiguous, organic air picture. The ABMOC is the gateway to the joint area air defense JTIDS net. It receives track reports from this net and adds those of interest to the FAAD battalion JTIDS net. It also provides tracks of interest to the joint net. Thus, low-altitude tracks undetected by HIMAD radars are provided to Patriot or Hawk units. The AME LNO or a sensor can serve as a continuity of operations mode for this facet of the system. Sensor C² subsystems act as gateways to the EPLRS net: tracks are filtered from the battalion net and are distributed to a community of users. The user batteries, platoons, sections and fire units can further filter the air picture to their specific area of interest.

C² Information

Within the FAAD C²I architecture, commands and information that are time sensitive or best suited for digital data transmissions are disseminated over the EPLRS net. Examples include changes to weapon control orders and air raid warnings. Pre-formatted computer messages eliminate the need for lengthy, time-consuming voice reports. To the maximum extent possible, data messages will be used. Of course, it will still be best to pass some messages and information by voice.

Piercing the Fog of Combat

The FAAD C²I mix of sensor subsystems, that includes aerial and ground as well as active and passive sensors, is sometimes described in the media as "expensive" and "complex." It would be better described as "cost-effective" and "absolutely essential." The success of U.S. warplanes against Soviet surface-to-air missiles in Lybia is a recent reminder that air defense systems which rely solely on active sensors are extremely vulnerable to countermea-



sure. Such systems are unable to protect themselves, much less defended assets, against air attack. They serve mostly as additional targets, forcing attacking air squadrons to expand their target list. The FAAD C²I system is complex simply because there is no easy solution to the air defense problem.

FAAD C²I provides badly needed capabilities to our forward air defense forces. Coupling real-time command capability with accurate battlefield information gives FAAD leaders the data they need to effectively counter the air threat. Additionally, FAAD C²I is tailorable to all types of Army FAAD units from heavy divisions to units at echelon above corps. Although probably the least glamorous of all FAAD components, FAAD C²I binds the other components together and magnifies their effectiveness. With an integrated, effective air defense, force commanders are allowed the freedom of maneuver necessary to fight and win on any modern battlefield.

Maj. Michael Howell is the deputy forward area air defense TRADOC system manager officer for FAAD C²I.

Capt. Steven E. Peters is the assistant TRADOC system manager for FAAD C²I sensors.

Can Corps Chaparral Support Any Contingency?

by Capt. Helmut P. Roberts



The successful *Team Spirit 1986 deployment*

of some elements of the 7th Battalion, 7th Air Defense Artillery (Corps Chaparral), Fort Ord, Calif., marked the opening of a significant new chapter in the annals of air defense. As the first pure corps Chaparral battalion activated in the Army, 7/7th ADA, a dedicated I Corps asset, seized the opportunity to formulate and refine doctrine that governs its new tactical direction.

The mission statement of 7/7th ADA underscores the formidable and diverse challenges confronting the corps air defender: "... to provide dedicated low-altitude air defense in support of any I Corps contingency."

At first glance, long-time air defenders may understandably find themselves prone to express more than a few verbal innuendos of skepticism. The Chaparral system has all too often been perceived — both in and out of the air defense community — as the foundation and, indeed, the heart of an effective static defense. The traditional integrated air base defense mission assigned to the Chaparral/Vulcan units of U.S. Army Europe has done much to perpetuate this concept. Despite the proven ability of these systems to integrate and execute successfully with maneuver forces, the relegation of the Chaparral, in particular, to an extensive static defensive role has persisted.



The movement forward of corps Chaparral will be a treacherous operation at best.

The formation of a corps Chaparral battalion signaled that a larger and more varied role for the use of the Chaparral might be in the offing.

The deployment of 7/7th ADA to the Republic of Korea from March 6 through April 3, and its use by the I Corps commander in several aggressive air defense support roles, seemingly confirmed the viability and versatility of corps Chaparral in augmenting the existing organic air defense artillery of maneuver units. This freeing up of ADA assets allowed the supported maneuver force commander to swiftly traverse choke points and traditionally hazardous

maneuver areas, such as river crossings, while retaining his organic ADA umbrella.

Theoretically, the repositioning of corps Chaparral assets along the expected route of march allows the attacking force commander to maintain critical momentum while allowing his organic air defense artillery (Vulcan and Stinger) to remain with him at all times. This eliminates the necessity of maneuver force elements having to experience, albeit temporarily, any degradation of organic ADA coverage once choke points and river crossings have been passed.

Using the corps's Chaparral assets holds many possibilities and offers the battalion and battery commander the opportunity for doctrinal innovativeness. However, capabilities of the system must realistically be examined and analyzed against mission requirements.

The concept of corps Chaparral in support of the light infantry division was tested extensively but not exclusively during Team Spirit 1986. Tasked with a general support reinforcing mission to the 25th Infantry Division (Light) while in the attack, 7/7th ADA confirmed that the significant and timely insertion of additional ADA assets can help ensure the success of the supported force.

With the integration of the light infantry division into the force structure, challenges for providing adequate air defense to the maneuver unit have intensified. The dramatic downsizing of ADA assets organic to the light division configuration (*Air Defense Artillery*, Fall 1985) will undoubtedly result in early requests by the division commander for augmentative air defense from corps. While the granting of such requests may well entail temporarily stripping dedicated ADA protection from corps assets, the possibility of just such an eventuality can never be discounted.

This exact scenario was played out during the river-crossing operation conducted by 7/7th ADA in support of 25th Infantry's operations. The division commander requested additional ADA support from the corps commander who gave his approval and tasked 7/7th ADA with the augmentation mission. The limitations, however, of corps Chaparral assigned such a role were soon made apparent. Deployed forward in support of maneuver forces conducting a counterattack, Chaparral platoons en route to mission locations experienced several threats to a successful deployment, the least of which was threat from air attack.

The current table of organization and equipment (TOE) for the corps Chaparral battalion is conspicuous by its failure to include manportable air defense systems. The absence of a quick-response weapon for an unexpected pop-up air attack thus renders the forward moving corps Chaparral unit particularly vulnerable. This is especially true in Korea where extensive cross-country movement by tracked vehicles is severely restrict-

ed by geographical impediments which most often relegate tracked vehicle movement to established thoroughfares.

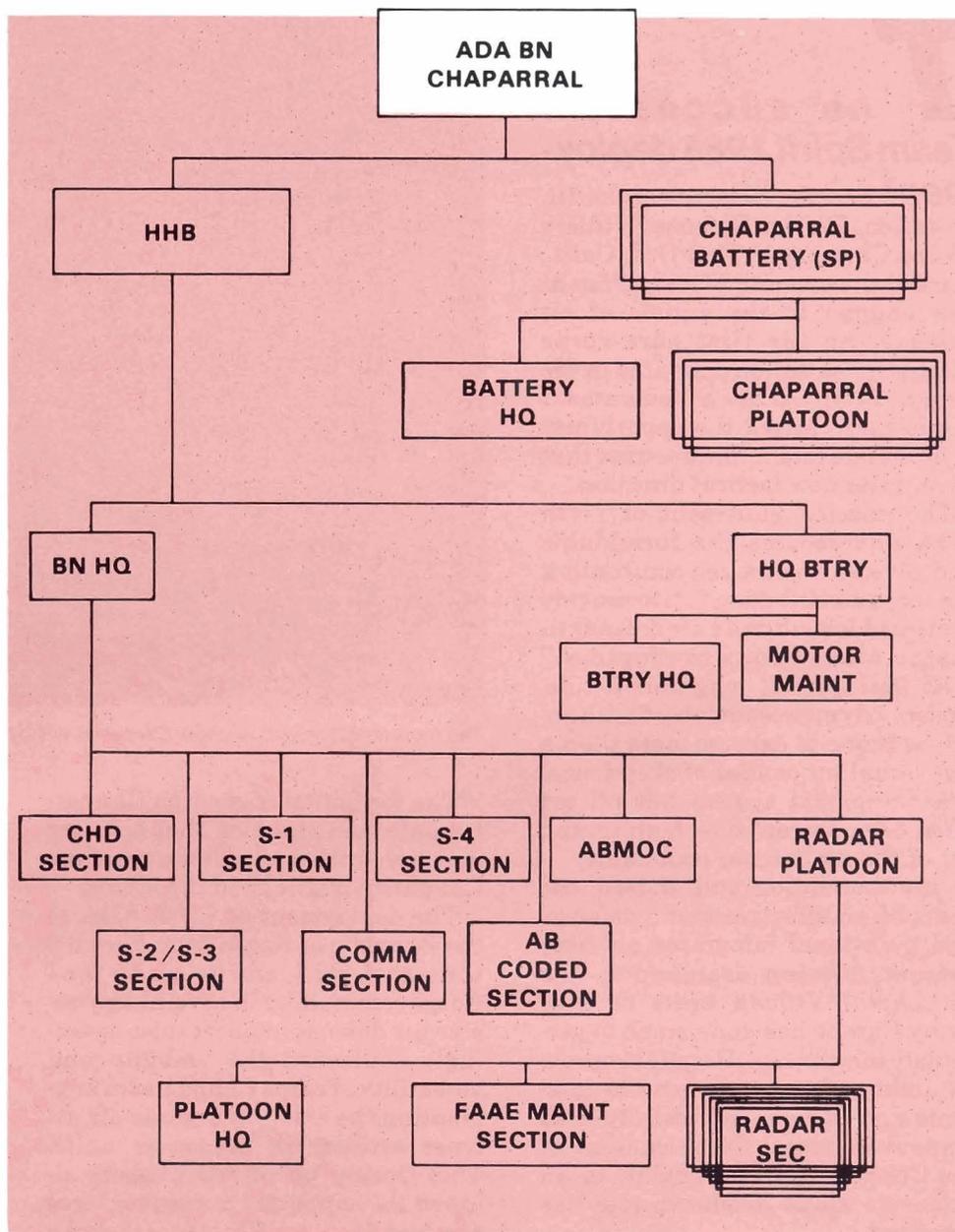
The mountainous terrain prevalent throughout the peninsula is characterized by numerous valleys which favor threat rotary-wing aircraft and provide a formidable challenge to the ADA tenet of early engagement.

Dependent upon a particular area of operations, even the use of the forward area alerting radar and close coordination with the control and reporting center might well prove inept to surmount the intensified threat of unexpected attack. The masking protection afforded by the terrain existing throughout the Republic of Korea will reduce early warning, particularly of threat rotary-

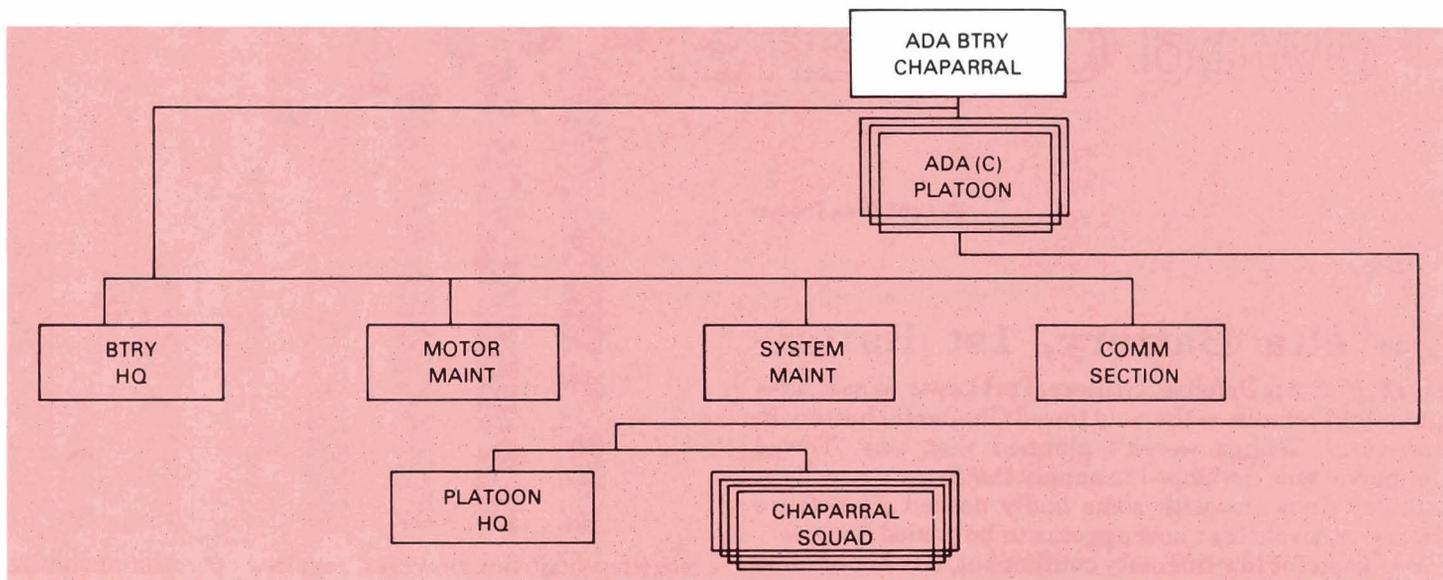
wing aircraft, from minutes to seconds. Short-range air defense will rely at times solely on visual acquisition.

The success of the light infantry division is dependent upon its skill in countermobility techniques and expertise in terrain exploitation. Translated for the corps air defender, this means the light division will avoid main highways and roads, creating the unpleasant but real probability of corps ADA assets moving through partially or totally unsecured areas. This point was vividly underscored when platoons of B Battery, 7/7th ADA, moved forward in support of the 25th Infantry's deliberate crossing of the NamHan Gang river.

To survive, light fighters must not be seen nor allow themselves to



ADA Battalion Corps Chaparral



Corps Chaparral Firing Battery

become decisively engaged. As a result, air defenders can expect little or no help when moving forward in support of the maneuver force. This knowledge will be vital, especially when deploying in support of a counterattack! Several times throughout the exercise, while traveling through areas commensurate with the farthest advancing line of 25th Infantry soldiers, Chaparral platoons encountered pockets and remnants of enemy resistance, both armored and infantry. Forced to traverse unsecured roads, Chaparral platoons suffered heavy casualties.

Can corps Chaparral successfully be deployed forward in support of the light infantry division? The answer, given the current tactical configuration of the corps Chaparral battalion, would have to be that it is questionable. The lessons learned have yielded proposed modifications — which I submit clearly define the role and limitations of the corps Chaparral battalion as currently structured — and indicate areas for improvement and increased combat effectiveness.

★ Current MTOE 44345JFC02 for the corps Chaparral battalion should be modified to include an adequate manportable air defense option. In its present configuration, the corps Chaparral battalion is especially vulnerable to pop-up air attack. In addition, its current “pure” composition detracts from its ability to present a truly vigorous and effective defense. The inability of the corps Chaparral battalion to incorporate and use an effective mix of air defense systems (Chaparral and Stinger) underscores

limitations of the Chaparral, simplifies threat attack strategy and marks the pure Chaparral defense for an easy defeat.

★ The forward employment of corps Chaparral, particularly in support of the light infantry division, is imprudent for several reasons, not the least of which is its current TOE. While the temporary augmentation of organic division ADA assets would benefit the division, especially when in the attack, the flaring vulnerability of corps Chaparral in such a role negates the possible advantages to be gained. The current tactical employment guidelines for the light infantry division, coupled with corps Chaparral organization, seem to render the success of such a venture improbable. This is the wild card that must be factored into the corps commander’s decision-making process. The high probability is that the “temporary” stripping of the ADA umbrella encompassing his assets may well assume permanency when the Chaparrals are assigned a forward deployment mission.

★ Platoon leaders assigned such a mission must take it upon themselves to not only demand but actively seek out the most current intelligence information concerning enemy activity within and along their proposed route(s) of movement. This cannot be overemphasized. Besides close coordination with the battalion S-2, platoon leaders from B Battery, 7/7th ADA, had constant contact with the attached ROK Vulcan elements. While this option will not always be so readily available, the vital link between U.S. forces and

host nation representatives can never be disregarded. Several times during the exercise, ROK air defense liaison officers provided intelligence information which was both more timely and accurate than that available through U.S. channels. It is, therefore, critical that actual use and not merely lip service is paid to the concept of joint/combined operations.

The movement forward of corps Chaparral, specifically in support of light infantry which, for all purposes, conceded roadways to enemy forces, will be a treacherous operation at best. Platoon leaders must remain cognizant of their hazardous position and limitations, and proceed accordingly.

While the corps Chaparral asset may well be tasked the support mission of augmenting the light infantry division organic ADA assets, its present organization marks such a venture prohibitively costly in terms of soldier and material loss.

As borne out by Team Spirit 1986, the corps Chaparral asset possesses the potential for use throughout a varied spectrum of challenging roles. However, forward support of the light infantry division does not appear at present to be one of them. I, therefore, submit that the corps Chaparral battalion is apparently best suited for a static defense mission of assets located in the corps rear.

Capt. Helmut P. Roberts is commander, Headquarters Battery, 7th Battalion, 7th Air Defense Artillery (Chaparral), Fort Ord, Calif.

Towed Chaparral

By Capt. Rock Thomas

Delta Battery, 1st Battalion, 67th Air Defense Artillery, Fort Lewis, Wash., is — and might remain — the only towed Chaparral battery in the world. Things weren't planned that way. Towed Chaparral was developed to supply the Army's new light infantry divisions with some badly needed air defense firepower, a role that now appears to be denied it.

Designed for low-intensity conflict but, it is hoped, able to hold their own in mid-intensity warfare, the Army's light divisions will be able to deploy in approximately 500 sorties to trouble spots or lodgement areas around the world. They will be lean and mean, just the way Army Vice Chief of Staff Gen. John W. Vessey Jr. envisioned them back in 1980. "We want a light division that is easy to move, that is strategically deployable quicker and easier than it is now," Vessey said. "It needs to be tougher when it gets there. It must be able to fight the Soviets and Soviet-equipped forces anywhere!"

The light divisions, however, won't have as much air defense firepower as air defenders originally hoped. Chaparral has been deleted from all divisions, and even the space allotted to towed Vulcan is now threatened by the debate over whether or not the light division's 500-sortie maximum should be reduced to 475 sorties. This means the light divisions may have only Stinger crews to counter any air threat they may encounter.

It doesn't mean, however, that towed Chaparral is dead. The test and evaluation program that began in 1981 has been kept alive by the interest expressed by I Corps and XVIII Airborne Corps for towed Chaparral in their organic ADA brigades. Delta Battery continues to work in close harmony with the 9th Infantry Division and the Army Development and Employment Agency (ADEA) to fully develop towed Chaparral's potential.

The towed Chaparral concept was born in 1981 when ADEA and the now deactivated 9th Infantry Division Air Defense Artillery (DIVADA) were partners in the Army's high-tech testbed. Air defense artillerymen tasked to come up with new air defense solutions to the problem of supporting the light divisions described by Vessey faced a difficult challenge: reduce total weight and number of airframes required for rapid deployment and lodgement of an air defense missile system while retaining the maximum air defense capability so vital on the modern battlefield.

Ford Aerospace & Communications Corp., the designer of the self-propelled Chaparral, was asked to design a new Chaparral that would reduce the number of required aircraft sorties, provide immediate lift capability and improve the main power unit for extended operations. The result was towed Chaparral, better known as T-Chap.

A system prototype was delivered to Fort Lewis in 1982 and was evaluated by Delta Battery. The T-Chap was approved for procurement in 1983 under the Army's quick-reaction program. Ford Aerospace delivered 12 tactical units and one float unit in 1984. The system's limited

purchase contract, however, required operational testing before the Army would commit to fielding more than the original 13 systems.

Characteristics

The T-Chap was first described in "Towed Chaparral: Firepower for Light Forces," an article by 1st Lt. Dan Mooney of the 1/67th, which appeared in the Spring 1984 issue of *Air Defense Artillery*. The T-Chap uses the same launching station and missiles as the self-propelled Chaparral. It's the trailer that makes T-Chap unique. The trailer is of aluminum box-frame construction. It uses an elliptical leaf-spring suspension with air-over-hydraulic brakes. The system rides on two, 3-inch square straight axles with four tires mounted in tandem. The trailer with launching stations contains all the equipment needed to aim and launch missiles. The equipment needed to operate the system is housed in the metal equipment compartment located in front of the trailer.

Fully equipped and serviced, including fuel and four storage missiles, T-Chap weighs 12,500 pounds, about half as much as the self-propelled version. It can travel at convoy speeds of 35 to 40 mph or 15 mph cross country and can negotiate obstacles up to 14 inches under the running gear. The T-Chap carries four spare missiles and basic issue items in a storage compartment in the trailer. However, crew equipment, supplies, spare parts and extra missiles must be transported by the towing vehicle.

The authorized prime mover is a M-923 five-ton truck which can tow three to five T-Chaps simultaneously. The T-Chap also can be towed for short distances by an M-151 ¼-ton truck or even a forklift.

The prime power subsystem consists of a diesel-powered unit (DPU) and four storage batteries required to furnish power during periods of peak transits and engine starting. A 48-gallon fuel tank located in the trailer structure carries enough fuel to operate the DPU and battery heater continuously for more than 24 hours. This enables the T-Chap to operate independently of any external power sources.

All T-Chaps are equipped with a forward-looking infrared (FLIR) subsystem that gives the system a day or night target acquisition and tracking capability.

The T-Chap needs no extensive preparation for an airborne operation. With four lift shackles and four chain slings, the system can be prepared in a matter of minutes. Once in its new location, T-Chap needs no special maintenance to become operational.

T-Chap vs. SP Chaparral

Since the first prototype was delivered in 1982, Delta Battery has used T-Chap during division, battalion and battery field training exercises, ARTEPs and annual service practices. Field operations have shown that T-Chap has some advantages and disadvantages compared to self-propelled Chaparral. However, both systems are effective, and the nature of the mission will determine the need for either T-Chap, SP Chaparral or both. Some of the advantages and disadvantages are listed below:

	XM-85 T-Chap	M-48A2 SP Chaparral
Basic Load	8 missiles*	12 missiles
Swim Capability	None	Yes, with 12'' wave limitations
Fording Capability	21''	40''
Height Clearance	103''	111''
Upgrade	27%	60%
Downgrade	27%	62%
Side Slope	20%	30%

*Additional missiles can be stored in prime mover.

Since it was designed to support light infantry divisions which must be fully deployable in approximately 500 C-141B sorties (about one-third the number required to deploy a standard infantry division), T-Chap possesses significant air deployability advantages.

Air Deployability	
	C-130
2 T-Chaps	1 SP*
	C-141B
5 T-Chaps	2 SPs
or	
1 M-923 & 3 T-Chaps	
or	
2 M-923s & 2 T-Chaps	
	C-5
8 T-Chaps	4 SPs
or	
1 M-923 & 6 T-Chaps	
or	
2 M-923s & 2 T-Chaps	
	Wartime Contingency C-5B
12 T-Chaps	6 SPs
or	
4 M-923s & 6 T-Chaps	
or	
2 M-923s & 10 T-Chaps	

*The canopies must be removed on SP Chaparrals.

Employment

The T-Chap can be employed in a number of ways. For example, its strong air deployability could make T-Chap the principal non-manportable air defense weapon used in lodgement operations. During the initial phase of the lodgement, T-Chaps would be quickly off-loaded with winches and mated with any prime movers available. An available five-ton truck could pull three to five T-Chaps simultaneously for rapid off-loading and emplacement. The T-Chaps would be placed to provide immediate air defense for the arrival airstrip or the lodgement area of operation. Transporting T-Chaps to the lodgement area would not force the division to exceed the doctrinal limit of approximately 500 aircraft sorties for light infantry divisions or 1,200 for the 9th Infantry Division (Motorized). Once emplaced, the T-Chaps would furnish vital air defense firepower to counter the type of air threat that, today, must be expected even in "Third World" contingency operations. Their arrival would free Stinger crews for follow-on missions in support of the maneuver forces as the lodgement expands.

Tailored to the mission, T-Chap, with its immediate airlift capability, can support maneuver forces in river crossings, passage of lines, tactical choke points, attack helicopter assembly areas, and forward area arming and refueling points. The T-Chap crew can operate in support of maneuver units with minimal concern for refueling due to the slow burn rate of the diesel power unit, although extended operations consideration should be given to maintenance, replacement of repair parts and the transportation of crew equipment.

The Future of T-Chap

Delta Battery is accomplishing its mission of transitioning the T-Chap into the Army family of ADA weapon systems through a rigorous schedule of field training exercises. Working in close harmony with the 9th Infantry Division's cavalry brigade, the battery has been provided with a realistic training environment that has included identification, friend or foe, multiple integrated laser engagement system and air mobility training with the T-Chap.



Towed Chaparral has significant air deployability advantages.



Weighing about half as much as the self-propelled version, towed Chaparral can travel at convoy speeds of 35 to 40 mph or 15 mph cross country.

Crew transition from SP Chaparral to T-Chap has proven relatively easy. The operation and maintenance is the same, only the location of some components are different. The biggest difference is the absence of an erect/retract system on the T-Chap. Other differences include a missile load ramp and emplacement pads. The missile load ramp, when attached to the rear of the trailer, provides a walkway for personnel loading missiles onto the launch rails. The replacement pads with jack screws are designed to firmly support the weight of the T-Chap during firing.

New tactics and crew drills are being developed. The 1/67th ADA and the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, are working together to finalize T-Chap crew drills and examine the effects of this new weapon on existing requirements such as skill qualification tests.

Due to its versatility, there are still many facets of T-Chap that have yet to be explored. One example is T-

Chap's shoot-on-the-move capability which has been successfully demonstrated, but has not yet been approved for use. One improvement being considered is the addition of floatation equipment (T-Chap can ford only to the depth of its running gear).

The T-Chap is a tough, versatile and easily deployable air defense weapon system. Soldiers who have crewed T-Chap — particularly those who fear our new light divisions may encounter a more severe air threat than expected even in contingency areas — are convinced it deserves a place in Air Defense Artillery's arsenal and a spot on the air-land battlefield.

Capt. Rock Thomas is the assistant S-3 for the 35th Air Defense Artillery Brigade, Fort Lewis, Wash. He is the former commander of D Battery, 1st Battalion, 67th Air Defense Artillery, the Army's only towed Chaparral battery.

Air Defense Korean Style



by Capt. Helmut P. Roberts

The "fearless fighters"

of the 7th Battalion, 7th Air Defense Artillery (Corps Chaparral), Fort Ord, Calif., had a unique opportunity to compare notes with allied air defenders during their participation in Team Spirit 1986.

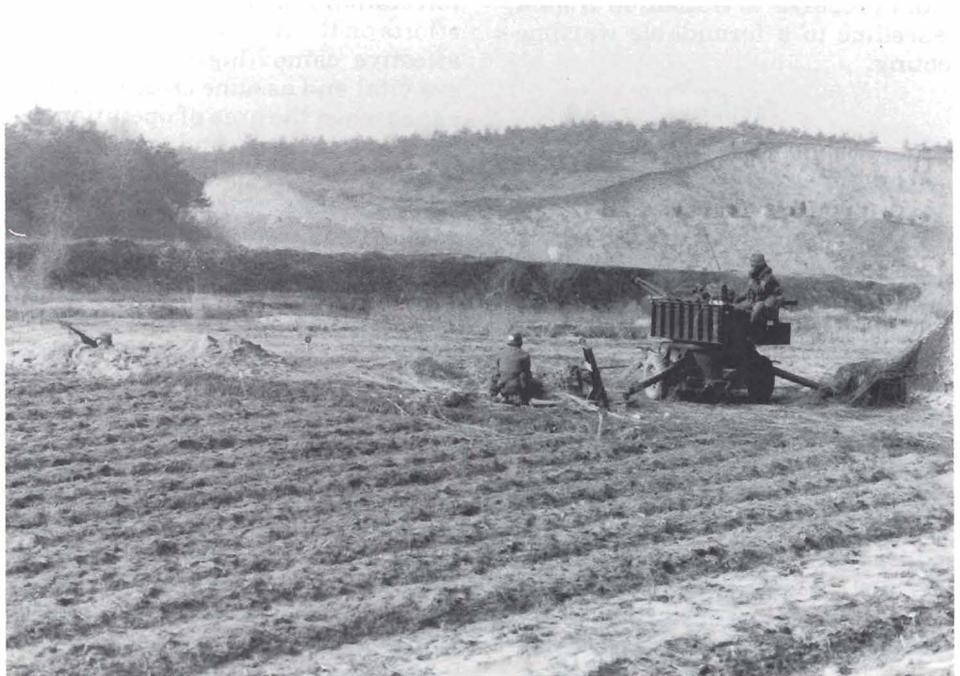
For the duration of the exercise from March 6 through April 3, Republic of Korea (ROK) soldiers of C Battery, 3rd Battalion, 502nd Air Defense Artillery (towed Vulcan), were attached to the battalion. The unit is commanded by Capt. Soe Yeoug Ho.

American soldiers, working side by side with their Korean counterparts, gained the priceless experience of conducting combined operations and overcoming doctrinal disparities with the armed forces of an allied nation.

In the following, I will detail the makeup of C Battery, 3/502nd ADA, a typical ROK Vulcan firing battery. I also will share some of the insights gained during the exercise.

Battery

The personnel allocation of a Korean Vulcan firing battery is 88 soldiers and five officers. The ROK air defense forces possess only the towed version of the Vulcan system. Tactical organization closely parallels that of the U.S. Army. The battery is commanded by a captain, and each of the three platoons is led by a lieutenant. System maintenance is carried out by the assigned warrant officer. The one readily apparent dis-



Members of the ROK 1st Platoon, C Battery, 3/502nd ADA, perform crew drill during Team Spirit 1986.

similarity between the two organizations is that the Korean battery is not authorized an executive officer.

Platoon, Squads

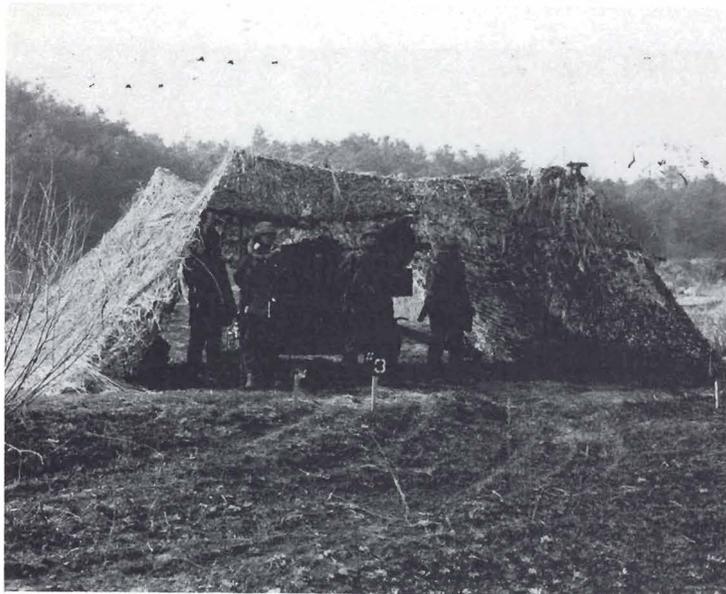
The platoon consists of a headquarters element and four Vulcan squads configured with four soldiers assigned to each squad. The platoon leader exercises command and control from his CJ-5 ¼-ton vehicle which is equipped with one AN/VRC-46 FM radio.

Squads use the one authorized PRC-77 radio. Additional communications throughout the platoon is done with TA-312 field telephones.

The platoon's basic load is moved in four 2½-ton 6x6 trucks. The load consists of 16,400 high-explosive, incendiary, tracer, self-destruct rounds; 20mm ammunition for the air defense mission; and 7,600 rounds of high-explosive ammunition less the tracers or self-destruct features available for ground suppressive fires.

Doubtlessly because of geopolitical realities, ROK air defense units always deploy with their actual tactical basic load. Regardless of the occasion, be it FTX, COMMEK or unannounced training exercises, ROK air defense units continually

Note the excellent results of camouflaging this ROK Vulcan position.



Korean air defenders perform crew drill outside Ansong, Korea.



stand prepared to transition from a peacetime to a formidable wartime footing.

Tactics

Some of the differences U.S. commanders must be prepared to accept are the rigid Vulcan employment principles that ROK air defenders practice. Although the basis for this article is predicated on C Battery, 3/502nd ADA, and its organization, conversation with officers and NCOs seems to indicate that these guidelines are for the most part universal within the ROK air defense forces.

ROK Vulcan battery commanders and platoon leaders exercise tight control over their weapon systems. Vulcans were never allowed to deploy further than 500 meters apart throughout the entire exercise. Efforts to work ROK Vulcans into an integrated point defense with Chaparrals of B Battery, 7/7th ADA, met with mixed success. Repeated consultations among ROK and U.S. battery commanders finally resulted in some relaxation of control.

American air defenders must remain mindful that FM 44-3 is not universal in acceptance, particularly among our allies. It is, therefore, vital that we remain flexible and open toward unfamiliar concepts. Our way is not necessarily the right or only way.

The ROK air defender is a master at camouflaging weapon systems and accompanying equipment. This dedication pays big dividends and assumes new meaning when considering that the Korean peninsula is devoid of any dense or extensive

forestation. Imaginative and timely efforts on the part of air defenders in effective camouflaging techniques are vital and assume critical significance when the area of operations is Korea. Current threat tactics, coupled with the ever-increasing standoff engagement capability of rotary-wing aircraft, underscored throughout Team Spirit the need for improvement, re-evaluation and increased emphasis on U.S. air defense system camouflage techniques and practices.

Early Warning

The Team Spirit deployment of 7/7th ADA was conducted without the battalion's six FAARs (they are being rebuilt and are not expected back until sometime in FY 1988). This gave the battalion the opportunity to seek out new avenues of early warning. Initially configured, early warning was to be relayed from I Corps to 35th ADA Brigade and down to 7/7th ADA. This cumbersome system proved to be tardy and ineffectual. Air defense warnings and weapon control statuses were often hours late in arriving and outdated upon receipt. In numerous instances, the Chaparral crews were kept in "red tight" for periods exceeding 12 hours, resulting in degradation of personnel effectiveness and morale.

This problem was finally resolved by stationing a ROK liaison officer in the 7/7th ADA tactical operations center. The liaison officer was able to maintain continual communications with a ROK mini control and reporting center located within the area of

operations. More the norm than the exception, ROK information on changes in weapon control statuses and air defense warnings was often received hours before the same information filtered down through U.S. channels. The information obtained through ROK command channels was consistently timely and accurate.

The presence of a bilingual host nation liaison officer at battalion level should not be discounted and should be considered a critical prelude to any successful operation in a foreign nation, be it a joint or sole U.S. venture.

The Team Spirit 1986 deployment of 7/7th ADA provided a wealth of experience which has yielded tangible benefits in the form of realistic expectations and extensive knowledge concerning joint operations. Familiarization with doctrinal requirements and procedures of their ROK counterparts has made the introduction to air defense "Korean style" a significant occasion for the first battalion of dedicated corps Chaparral air defenders.

Capt. Helmut P. Roberts is the commander of Headquarters Battery, 7th Battalion, 7th Air Defense Artillery, Fort Ord, Calif.



Viet Minh troops celebrate the downing of a French B-26 at Dien Bien Phu.

Dien Bien Phu: Counterair Turns the Tide

by Capt. Dale E. Brown

Late on the afternoon of May 7, 1954, a black-clad Prime Minister of France, Joseph Laniel, addressed the French National Assembly. In a barely audible tone he began, "The Government has been informed that the central position of Dien Bien Phu has fallen. . . ." Shock surged through the hall and the entire Assembly — except for 95 Communist members — rose to its feet. Laniel continued, "The enemy has wanted to obtain the fall of Dien Bien Phu prior to the opening of the conference on Indochina. He believes that he could strike a decisive blow against the morale of France. . . ." Those words contained the essence of Viet Minh strategy and represented belated recognition of Dien Bien Phu's strategic importance.

The siege of Dien Bien Phu ranks with Yorktown, Gettysburg, Midway and Stalingrad as a strategic turning point. In each of these epic battles, one side lost its chance of attaining whatever it had sought to gain in fighting the war. Dien Bien Phu sounded the death knell for French Indochinese colonialism and accelerated the United

States down its long, slippery slope of tragic involvement in Southeast Asia. Dien Bien Phu presents many lessons to a military professional, ranging from Clausewitzian theory to the provisioning of a multiethnic force.

A largely overlooked lesson is that Dien Bien Phu is arguably the only large-scale battle in which air defense, in the context of all measures taken to nullify the effectiveness of enemy air attacks and the synergistic freedom of operation it gave other combat elements, was the *decisive* element of victory. Bernard Fall, author of the authoritative work on the battle, *Hell in a Very Small Place*, concluded, "If any particular group of enemy soldiers should be considered indispensable to victory, then it must be the Viet Minh anti-aircraft gunners and their Chinese instructors."

Lieutenant General Henri Navarre replaced Gen. Raoul Salan as commander-in-chief of the French Indochinese forces on May 28, 1953. Although the cessation of hostilities in Korea had led to a greatly increased flow of American economic aid and materiel, the French government and nation were rapidly wearying of the casualties and financial drain the

Indochinese conflict represented. After a whirlwind tour of his command Navarre devised what became known as the "Navarre Plan" to break the Indochina stalemate and briefed the plan in Paris to the French Joint Chiefs. The plan had three basic parts:

- Remain on the defensive in the populous and major rice producing area of the Red River Delta. Increase pacification efforts to strengthen the French hold on the region.
- Launch an offensive into the lightly held Viet Minh area of the Central Highlands. This became Operation Atlante.
- Rapidly build up Vietnamese forces. Creation of a large army would allow the combined French and Vietnamese forces to assume the offensive in late 1954 and crush the Communists.

The creation of a strongpoint at Dien Bien Phu was an afterthought to support the first tenet of the plan. Its location in the northwestern part of Vietnam placed it in the rear area of the Viet Minh, and it was hoped that the offensive strikes that would emanate from the valley would disrupt the enemy supply flow and divert forces from the Red River Delta. As Dien Bien

General Giap inspects an anti-aircraft battery.



Phu was the terminus of the major road in the region, it was hoped that the base would block any Viet Minh incursions into Laos. Occupation would also deprive the Viet Minh of a primary opium-producing region; they bartered opium products for weapons. Although important, this was not the main reason why the French chose to occupy the positions, nor why the Viet Minh accepted the challenge of decisive battle.

The strongpoint concept was known as a *base aero-terrestre* (air-land base). It was grounded on the principle of aerial resupply as needed and use of firepower to repel assaults. Dien Bien Phu had two important precedents in the war. A previous Viet Minh invasion of Laos had been halted by a strongpoint on the Plain of Jars and, more importantly in Navarre's thinking, a *base aero-terrestre* had survived at Na San amidst numerically superior enemy forces in the Red River Delta.

The relatively barren plain around the fortified Na San position deprived the Viet Minh of camouflage and did not allow massing of artillery. Two assaults on the French position left more than 2,000 dead Viet Minh on the perimeter wire, victims of artillery fire and close air support. The defense of Na San, however, was maintained at a high cost to the French in terms of mobile reserves and dedication of almost all theater air assets. Navarre decided the high cost of defending Na San detracted from other operations and ordered an air evacuation, a move

that caught the Viet Minh by surprise and was carried out without a single casualty. It is significant that only small-arms fire harassed French aircraft at Na San, not larger caliber anti-aircraft guns. Na San became a fatally successful operation in Navarre's mind as he believed it could be repeated at will.

Occupation of Dien Bien Phu made eminent sense to the French; in hindsight, it seems thoroughly myopic. In addition to the diversionary effect and benefit of defending Laos, Dien Bien Phu possessed a runway capable of handling C-47 Dakota transports, and the flat terrain of the valley permitted armored operations. The distance from French air bases, twice that of Na San, and the surrounding jungle-covered mountains went unnoticed. Objections were raised on the grounds that the elite Foreign Legion and airborne units could be better utilized elsewhere in the theater, but no one foresaw the climatic fixed battle that was to ensue.

The Viet Minh situation in November 1953 was not good. The French strategic defensive was inflicting heavy casualties, and Viet Minh attempts to gain the initiative, such as Na San, ended in disaster. Their Chinese Communist allies had suffered far heavier losses in Korea than was realized in the West, and they ignored the Viet Minh pleas to intervene with military units in Indochina. Deliveries of materiel, particularly captured American artillery, were stepped up, and cadres of

battle-hardened soldiers were provided. Unit morale was low and hope that a favorable end to the conflict could be achieved by arms was kept alive only by the leaders. Viet Minh prospects reached an ebb when Ho Chi Minh, in an interview with a Swedish newspaper, expressed a willingness to consider a battlefield truce while a political compromise was negotiated.

The French establishment of the Dien Bien Phu position gave Ho a golden opportunity at his darkest hour. In Clausewitzian terms, he was offered a chance to strike a blow at the French "center of gravity" which was not at Dien Bien Phu but in Paris. By fixing the elite French forces, although only 10 percent of French Indochinese strength, into a set-piece battle and annihilating them, Ho would strike a mortal blow at French social and political resolve.

The battle of Dien Bien Phu began with a French airborne assault on the morning of Nov. 20, 1953. Viet Minh forces stationed in the valley to oversee the opium harvest were taken by surprise and gave only light resistance before fading into the surrounding hills. The following weeks saw a steady stream of transports deliver more troops, artillery, engineers with bulldozers, and a squadron of light tanks. A squadron of World War II dive bombers was deployed to the airfield to provide close air support. All told, 12 battalions of combat-hardened airborne infantry and Foreign Legionnaires were committed to the occupation of Dien Bien Phu along with seven batteries of artillery. Also among the more than 12,000 French and colonial soldiers was an anti-aircraft battery equipped with quad-.50 machine guns, a weapon that had been used with devastating effect against human-wave attacks in Korea.

Ho and Giap accepted the challenge of Dien Bien Phu on Nov. 26 and proceeded to marshal their forces. More than 40,000 Viet Minh soldiers, four infantry divisions and one Soviet-style heavy division composed of artillery, engineer and anti-aircraft units, along with untold thousands of impressed laborers made their way to the valley. Giap later wrote: "We came to the conclusion that we could secure success if we struck quickly. In consequence, we resolutely chose the other tactics: to strike surely and advance surely. We strictly followed the fundamental principle of the conduct of a revolutionary war: *Strike to win, strike only when success is certain; if it is not, then don't strike.*"

The Viet Minh movement to Dien Bien Phu is one of the great military feats of this century. The infantry divisions marched from the Red River Delta concurrently with transport of the heavy division from training bases in China. Included in the heavy division were the 37mm anti-aircraft guns of the 367th Anti-aircraft Regiment. The march entailed the reclamation of stretches of primitive road, the creation of detours through heavy jungle, and the shoring and construction of bridges capable of supporting 105mm howitzers towed by Soviet trucks; these tasks had to be accomplished while Viet Minh forces were subject to French air attacks.

The total length of the supply route, counting detours and bypasses, was more than 500 miles and included steep mountains and numerous streams. Thousands of natives were impressed to supplement the Viet Minh engineer units; many of them died anonymous deaths during the French air attacks.

The enormity of creating this supply route is better understood when contrasted with the celebrated 120-mile Burma Road of World War II that was built by American engineers with modern construction equipment and relative freedom from air attacks.

Navarre fully realized that the tide of the battle depended on whether the Communist supply line could be cut. His faith rested on the premise advanced by the U.S. Air Force that aerial bombardment had been decisive in defeating Germany. Neither the French nor the Americans recognized that a similar effort in Korea, "Operation Strangle," had not been able to halt the supply flow. The French dedicated more than 75 aircraft to the interdiction of the supply routes, and they dropped more than 650 tons of ordnance, much of it deadly anti-personnel bombs.

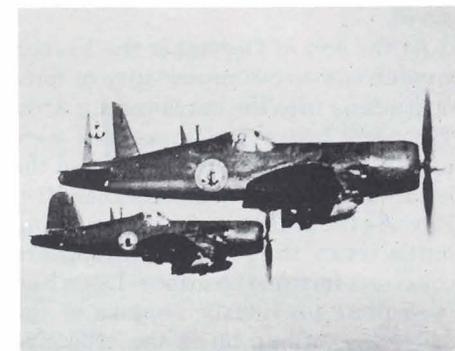
Two tactics were used. The French concentrated on single "cuts" at vulnerable targets such as the approaches

to the main supply depot at Tuan Giao and the crossings of the Black and Red Rivers. When that failed to stem the supply flow, the French tried multiple "cuts" along the lengths of the supply routes. Both methods killed thousands of porters and the rare truck caught in the light of day, but failed to stanch the flow of soldiers, supplies, and precious heavy weapons to the siege positions overlooking Dien Bien Phu.

The Viet Minh proved to be masters of camouflage, often tying tops of trees together to form veritable tunnels of vegetation and performing almost all movement at night. They also created a flak corridor composed of small arms and light (12.7mm) anti-aircraft guns. In the two weeks following the Viet Minh decision to contest Dien Bien Phu, 45 of the 51 bombers attacking the supply routes were damaged by ground fire while one fighter-bomber and two recon planes were shot down. The anti-aircraft fire grew so intense that the French were forced to dedicate large



As an engineering marvel, the Viet Minh network of roads and bamboo bridges rivaled World War II's Burma Road.



The French were forced to commit many sorties to flak suppression.

numbers of sorties to flak suppression.

When the route was obstructed by bombing, the laborers and the engineers assiduously repaired roads or bridges or made detours through the dense jungle. The ant-like procession of bicycles laden with 400 pounds of supplies and the small fleet of trucks towing heavy weapons never ceased. It is estimated that more than 10,000 tons of Viet Minh supplies transited the supply routes, a total roughly equal to the tonnage delivered by French aircraft. Joint U.S. doctrine (JCS Pub 8) defines air defense as: "All measures designed to nullify or reduce the effectiveness of attack by hostile aircraft. . . ." The passive (camouflage, movement at night) and active (ground fire) measures taken by the Viet Minh fit the definition quite well.

December and January witnessed a steady stream of VIPs to Dien Bien Phu, among them Lt. Gen. John "Iron Mike" O'Daniel, the U.S. Army Pacific commander, who forwarded an optimistic report to President Eisenhower. Of all the visiting experts, only one expressed extreme alarm. During his visit of Feb. 19, Gen. Fay, the French chief of air staff, exploded, "I shall advise Gen. Navarre to take advantage of the respite and the fact the airfield is still usable to evacuate every man he can, for he is done for!" It should be noted that by that date he may have had forebodings about the supply interdiction campaign, but he wouldn't declare it a failure.

Also interesting is the visit of three U.S. Air Force officers on Jan. 23. The French had solicited their opinion about possible Viet Minh anti-aircraft fire based on the American experience in Korea. The consensus of the airmen was that the enemy would have great difficulty bringing anti-aircraft guns to the valley, and they would be vulnerable to counterbattery fire. In any case, night resupply would be possible and the survival of the position was assured.

At the end of December the French conducted two reconnaissance-in-force operations into the surrounding area. They met heavy resistance and were unable to hold terrain; thus ended the hoped-for offensive benefit of Dien Bien Phu. As the reality of the approaching battle set in, the French scrambled to construct fortified positions. Little had been done previously because of the belief they would be on the offensive and few construction materials were available. The French artillery commander, Col. Charles Piroth, remained

blissfully optimistic. He boasted that the Viet Minh wouldn't be able to get artillery to the valley, they couldn't supply them if they did, and his crack gun crews would knock out any enemy artillery within 15 minutes. Colonel Piroth committed suicide two days after the siege began.

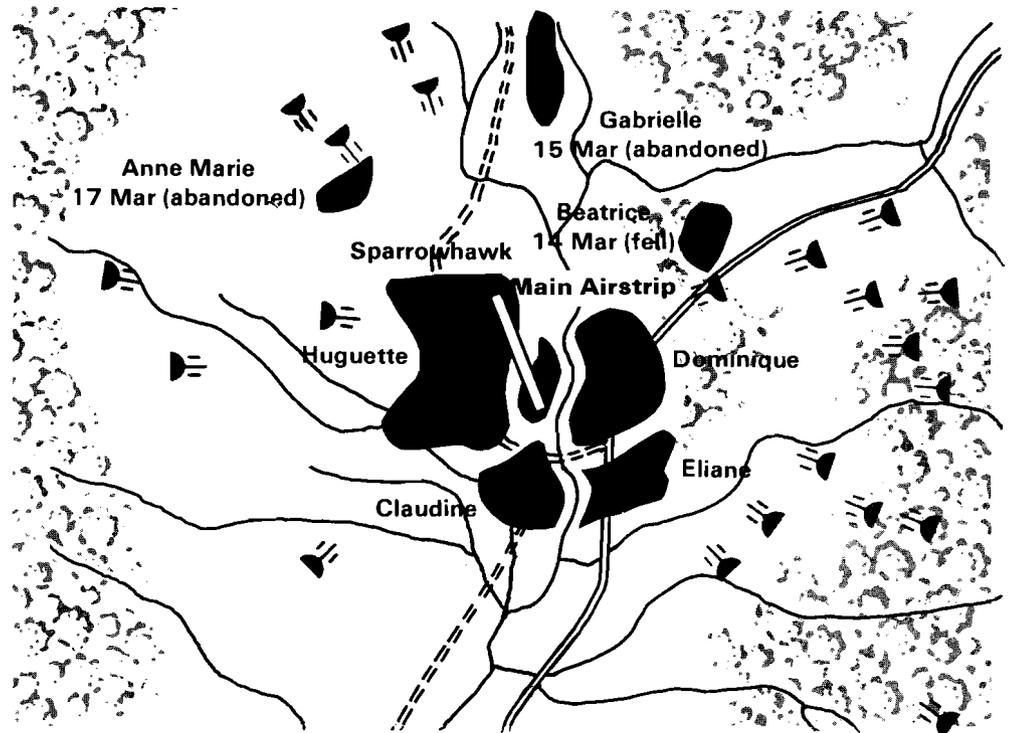
The battle of Dien Bien Phu began in earnest at dusk March 13, 1954. An artillery barrage targeted on the airfield and strongpoint Beatrice, a key outpost in the surrounding hills, surprised the French with its volume. It quickly became apparent the French were outgunned by four-to-one. Contrary to doctrine and French expectations, the Communist artillery was located on the front side of the surrounding hills, not the reverse slopes. The Viet Minh guns were heavily fortified and proved immune to counterbattery fire. At the same time the 37mm anti-aircraft guns of the 367th AAA Regiment opened fire on air traffic over the valley from previously undetected positions along the take-off axis of the airstrip.

As night settled, a human-wave assault overwhelmed the Algerians and Legionnaires on Beatrice. The loss of the outpost threw the valley into gloom because the entire French position was now under direct observation and subsequent fire. The anti-aircraft fire and artillery made day aircraft landings an act of folly. Night landings and parachute drops from high altitudes became

the only means of resupply. Even massive napalm strikes had little effect on the Viet Minh gunners. On March 15, Gabrielle, another outpost on the northern flank, fell after extremely heavy fighting. The Communists quickly moved anti-aircraft guns to the newly conquered heights to reduce their range to the transports supplying the valley. Under the tutelage of their Chinese advisors, the Viet Minh gunners improved and forced French transports, including chartered American-flown cargo planes, to drop supplies from over 10,000 feet.

The battle then evolved into a siege phase reminiscent of Flanders, especially when the monsoon rains arrived early to add to the French woes. Indeed, when Col. de Castries requested doctrinal guidance, trench warfare manuals dated 1916 were parachuted to him. General Giap turned to trench warfare because time was now on his side, and he had lost thousands of casualties in the attacks on Beatrice and Gabrielle. A trench system was dug under the cover of darkness around the entire French position and expanded inward to cut the airstrip in half, rendering it unusable. The last French plane took off April 6, taking with it the final hope of escaping the valley.

French counterattacks consumed valuable ammunition and soldiers, but failed to regain the lost outposts or break the Viet Minh stranglehold. One foray was particularly costly and tragic



Viet Minh 37mm anti-aircraft batteries ringing Dien Bien Phu's landing strip forced the French to rely on parachute drops for resupply.

in its failure. "The Fog of War," Clausewitz's version of Murphy's Law, appeared when the commander of the assault, safe in his bunker, tuned his radio to the wrong frequency. When nothing was heard, he assumed the attack was going according to plan. The fate of a battalion was sealed when pleas for artillery support and reinforcements went unheard.

The gradual constriction of the French position steadily reduced the size of the supply drop zone. More and more supplies fell into the hands of the Viet Minh. While the French rationed their artillery fire, they were pounded by captured 105mm howitzer rounds and 4.2-inch mortar shells. Consideration was given to a scheme involving dropping defective artillery shells that would explode upon firing behind Viet Minh lines, but the plan was discarded when the possibility of the shells falling into French hands was considered.

Still, the supply of more than 12,000 soldiers and non-combatants for nearly two months solely by air drops was a remarkable achievement. Adding to the problem of supply quantity (minimum of 150 tons per day) were peculiar requirements such as non-pork food for the Algerian and Moroccan Moslems, large amounts of rice for the Vietnamese, and wine for the French (more than 49,000 gallons were dropped). The supply effort exhausted French and American inventories of parachutes and cargo containers. By the end of the

battle, aerial photographs portrayed a snow-like cover of parachute silk over the cratered landscape.

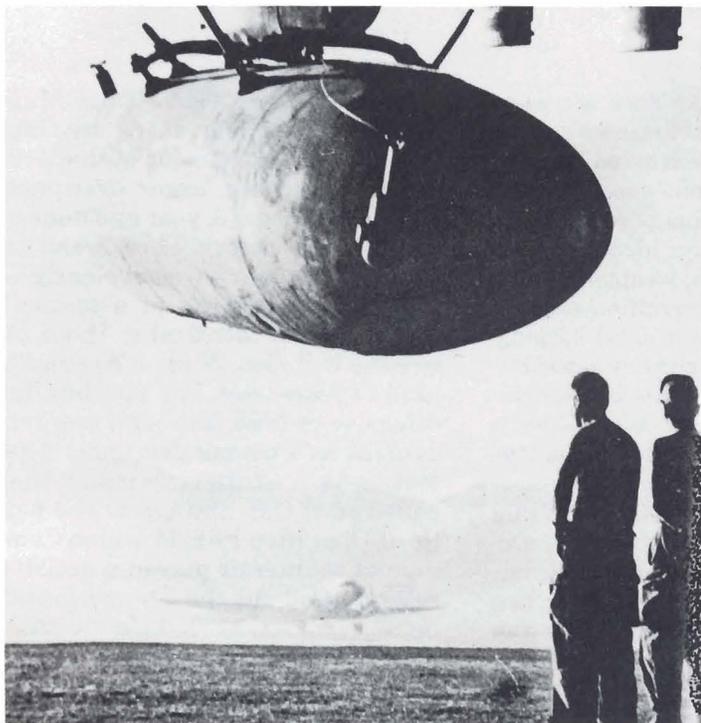
French options for resolving the Dien Bien Phu dilemma were limited. No forces of sufficient size were in position to attempt a breakthrough, every aircraft in the theater was already involved in the supply effort or attacking the Viet Minh positions or supply routes, and a mass escape attempt was judged suicidal. Both sides realized the upcoming Geneva talks hinged on the siege's resolution. French hopes centered on holding out until a cease fire could be negotiated as part of the peace conference or persuading the United States to intervene.

Admiral Arthur Radford, chairman of the U.S. Joint Chiefs of Staff and proponent of the "New Look" military which featured nuclear-armed air and naval forces over costly land forces, proposed massive intervention by U.S. carrier aviation and B-29 bombers based in the Philippines. General Matthew Ridgway, the Army JCS representative, adamantly opposed intervention because he felt the air strikes would fail and invariably lead to introduction of ground forces, an action for which neither the Army nor the nation was prepared. Serious discussion was given to the use of atomic bombs either by the United States or by giving them to the French. Air Force JCS member, Gen. Nathan Twining, enthused, "You could take all day to drop a bomb, make

sure you put it in the right place. . . and clean those 'Commies' out of there, and the band could play *Marseillaise*, and the French could come marching out in great shape." Eventually the intervention question hinged on British agreement to join the war, something the British facing colonial problems of their own would not do. Prime Minister Churchill dismissed the plight of the Dien Bien Phu garrison stating, "I have suffered Singapore, Hong Kong, Tobruk; the French shall have Dien Bien Phu. . ."

The French garrison felt increasingly isolated and forgotten by the outside world. The gloom intensified when no attempt was made to parachute supplies on Easter Sunday, and clippings of a *Le Figaro* article titled "Could 100 Planes Have Saved Dien Bien Phu?" appeared in personal mail. The sound of digging neared the French perimeter, and it was clear the final assault was near. The communists displayed the disconcerting habit of monitoring French radio channels and offering surrender in flawless French. Like the Navaho radio operators of World War II fame, French officers resorted to unfamiliar languages such as English or Breton for planning operations over the radio.

The final battle began with the appearance of two weapons from earlier wars. A mine packed with tons of explosives similar to those exploded at Messines Ridge in Flanders and at Petersburg in



Napalm-loaded fighters were unable to suppress Viet Minh anti-aircraft and artillery fire.



General Giap at his jungle command post near Dien Bien Phu.

the American Civil War was detonated beneath a key French position, killing or paralyzing the defenders. *Katyusha* rocket launchers, which gained fame on the Eastern Front of World War II, made their first appearance at Dien Bien Phu with devastating effect. Battle lines merged, and air strikes fell on French and Viet Minh alike. A French battery of quad-.50s acquitted itself well during the entire siege, often stopping human-wave attacks by itself. It is credited with being the last French weapon to offer resistance. After a valiant struggle to the very end, French resistance ceased at 5:30 p.m. on May 7.

The effect Viet Minh anti-aircraft fire had on the French air sorties was summed up by Lt. Col. Dussol, the bomber commander. He flatly stated that, "The Flak over Dien Bien Phu was far more intense than anything I experienced over Nazi Germany." The American cargo plane pilots, all of them combat veterans, concurred with his opinion. All told, 48 aircraft were shot down during the siege phase of the battle, and 167 were damaged to some degree. This was from an initial force of only 250 aircraft. Particularly telling was the downing of two B-26 bombers from an altitude of 9,000 feet on the same day.

The official French "lessons learned" report on Indochina stated that a position defended by anti-aircraft weapons should only be attacked by at least 20 aircraft and from all possible directions. It also contained the thinly veiled excuse for air force performance by saying jet aircraft were needed, a lament that ignores decreased loiter time and smaller bomb loads for such planes.

The anti-aircraft operations conducted by the Viet Minh fit the U.S. mission statement for air defense, but to call these actions "defense" would be a misnomer. They were closer to British Lt. Col. Michael F. Bremridge's concept of counter-air ("Opinion: Counter-air or Air Defence," *Air Defense Artillery*, Fall 1983) than to the common conception of air defense as protecting assets. The Viet Minh sought to destroy every French aircraft possible, regardless of aircraft location, mission or route. Any defense of positions or units was purely coincidental. While protecting critical assets and point defense are still important concepts, such counterair elan provides an important lesson for today's air defender. The fact that the Viet Minh had no friendly aircraft or need for IFF, weapons control orders, airspace control



The last helicopter out of Dien Bien Phu evacuates wounded.



Viet Minh infantry atop the French command bunker at the end of the siege.

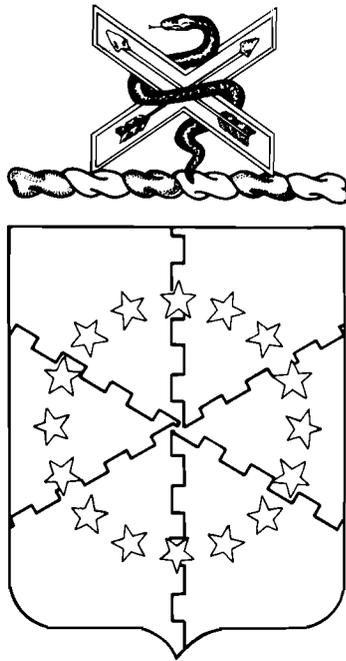
measures and the like does not radically diminish its relevance. An enemy aircraft should not be ignored because it is not threatening one's sector of fire or defended asset. This is contingent, of course, upon positive identification, the tactical situation, weapon system capabilities and ammunition supply. Such thinking is not in total keeping with current doctrine and mission statements, but bears examination because an aggressive counterair spirit may turn the tide of a future battle just as it did at Dien Bien Phu.

Study of the battle of Dien Bien Phu can be invaluable to the military professional. The lesson that air defense, particularly aggressive counterair, can be the difference between victory and defeat is clear. Dien Bien Phu is replete with case studies in combat leadership, fire support, logistics, law of war and many other vital topics. The larger, strategic lessons bear special attention.

In September 1953, *Time Magazine* ran a cover story on Gen. Navarre. The conclusion of that article has haunting, ironic overtones. Navarre stated, "A year ago none of us could see victory. There wasn't a prayer. Now we can see it clearly — like light at the end of a tunnel." Words almost identical to those uttered by U.S. Gen. William Westmoreland 14 years later. The Vietcong Tet offensive of 1968, although now recognized as a communist tactical defeat, was a strategic victory that ended such U.S. optimism. The battle of Dien Bien Phu, in which Communist counterair played a decisive role, snuffed out the French tunnel light.

Capt. Dale E. Brown is assistant editor of *Parameters*, *Journal of the US Army War College*. An ADA officer, he holds a master's degree in history from Ohio State University, Columbus, Ohio.

First of Air Defense Artillery's Regiments Activated



The Army's first Air Defense Artillery regiment was activated in mid-August at Schofield Barracks, Hawaii, home of the regiment and its colors. The colors of the 62nd Air Defense Artillery Regiment were unfurled during a ceremony hosted by the 1st Battalion, 62nd Air Defense Artillery, 25th Infantry Division.

A highlight of the activation was the presence of retired Col. Adam S. Buynoski who commanded the 1st Battalion, 62nd Coastal Artillery (anti-aircraft), in World War II. Buynoski led the battalion through major campaigns in Algeria, Tunisia, Sicily, Italy, France and Germany. He is now honorary commander of the regiment.

The 2nd Battalion, 62nd ADA, formerly the 1st Battalion, 51st ADA, is assigned to the 7th Infantry Division (Light) at Fort Ord, Calif. The 3rd Battalion, 62nd ADA will be organized and assigned to the 10th Mountain Division at Fort Drum, N.Y. The 4th Battalion, 62nd ADA will be organized and assigned to the 6th Infantry Division (Light) in Alaska. The 5th Battalion, 62nd ADA, formerly 4th Battalion, 1st ADA, is assigned to the 11th ADA Brigade, Fort Bliss, Texas.

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

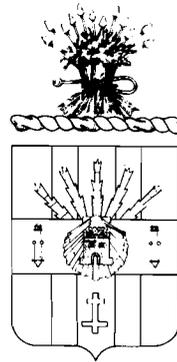
The regimental system benefits both soldiers and the Army, stated Brig. Gen. Leslie E. Beavers, director of Personnel Plans and Systems, Officer of the Deputy Chief of Staff for Personnel, Washington, D.C. "Soldiers will have the opportunity for long-term identification with a unit. They will have the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

The history of the 62nd ADA regiment is enduring and spirited. Constituted Aug. 1, 1921, in the Regular Army as the 2nd Anti-aircraft Artillery Battalion it was organized Sept. 4, 1921 at Fort Totten, N.Y. from existing units. It was redesignated June 1, 1922 as the 62nd Artillery Battalion (Anti-aircraft). It was reorganized, redesignated and inactivated until, finally, it was redesignated Sept. 1, 1971, as the 62nd Air Defense Artillery.

The heraldic items of the regiment include the coat of

arms with a shield of a gyronny of six embattled sectors of azure and gules and a circle of 16 mullets argent. The six embattled sectors symbolize participation in six wars by units of the 62nd Coast Artillery, from which the 62nd ADA is descended — the War of 1812, Indian Wars, Mexican War, Civil War, War With Spain and the Philippine Insurrection. The blue and red and the 16 mullets commemorate the date one element of the regiment was organized, 1798 (the uniforms worn by artillery soldiers were dark blue faced with scarlet and there were 16 states in the Union). The saltire, alluding to the flag of the Confederacy, is blue to indicate that service of the elements of the regiment during the Civil War was with the Union Army. The two arrows represent the Indian Wars and the serpent the Mexican War. The regiment's motto is "*Nitimus in Alta*," which means "Aim at High Things."

Beavers believes, that as it is implemented, the regimental system will give soldiers the opportunity to "serve with their comrades and enjoy a sense of belonging." Beavers also said that this will enhance unit readiness while allowing the Army to stabilize force structure and adapt to modernization changes.



A Second ADA Regiment Is Activated

The second Air Defense Artillery regiment reactivated was the 4th Air Defense Artillery Regiment during a ceremony Sept. 13, at Fort Bragg, N.C.

Constituted June 1, 1821 in the Regular Army as the 4th Regiment of Artillery, it was organized from new and existing units with its headquarters at Pensacola, Fla. On Sept. 1, 1971, the 4th Artillery, less the former 4th Field Artillery Battalion, was reorganized and redesignated as the 4th Air Defense Artillery. It became a parent regiment under the combat arms regimental system. The former 4th Field Artillery Battalion was concurrently reorganized and redesignated as the 4th Field Artillery under separate lineage.

The shield for the 4th Air Defense Artillery regiment is scarlet (for artillery) with two white stripes, representative of the campaign streamer for the War of 1812. It depicts the age of some of the units of the regiment. The green fess refers to the Mexican War service, and the two silver cannon allude to those lost without dishonor and regained with glory during that war.

The escallop, the emblem of St. James, with the Spanish castle, represents the battle of Santiago, Cuba in which elements of the regiment participated. The Lorraine Cross signifies the service of a battery of the regiment in Lorraine during World War I. The five rays, indicative of the aurora borealis, denote the service of batteries of the regiment in Alaska.

The regiment's motto is "*Audacia*" which means "By Daring Deeds."

ADA Alive and Well

Much discussion of late has centered on the so-called demise of Air Defense Artillery. It seems the secretary of defense's recent decision to terminate the Sergeant York divisional gun system brought out many nay-sayers, both within the air defense community and throughout much of the rest of the Army.

Fortunately, for both the branch and the Army the purported "death" of Air Defense Artillery has been greatly exaggerated, to paraphrase a line from Mark Twain. In fact, I'm very pleased to report that, here in Europe, air defenders are very much alive and well and are being accorded daily opportunities to "make history," as Gen. Wickham is fond of saying. Let me explain.

In just the last year, two proven Patriot missile battalions have arrived in 32d AADC, earned final certification and have taken their place on line defending NATO's airspace. Patriot's state-of-the-art, anti-aircraft firepower, mobility and capability to operate and survive in a heavy electronic countermeasure environment have permitted us to rapidly phase out selected and more obsolete air defense systems. For example, Nike Hercules, once the mainstay of air defenders in Europe, is now completely out of our inventory. With the inactivation of the 3rd Battalion, 71st Air Defense Artillery, Nike Hercules left Europe in 1984. Additionally, several Hawk battalions have also been withdrawn from the European theater to make way for future Patriot battalions.

Hawk, although now fewer in number, is similarly alive and well, for while Patriot has been the narrow focus for much of the air defense community, Hawk has been undergoing many important changes also. Not only have all our Hawk units completed the Phase II Product Improvement Program, but most have also been reconfigured into the BIAD alignment. Under this deployment concept Hawk is much more mobile, possesses greater firepower and can deploy and fight in an assault fire unit configuration much quicker than a normal battery. Enhanced by greater firepower and less encumbered by the reduction of equipment and cabling necessary to deploy to the field, Hawk should continue to provide reliable air defense coverage in Europe well into the 21st century.

The end result of all these doctrinal and hardware improvements will be a theater Army air defense command that is leaner, prouder, more skilled and more capable to face the threat of 1990 and beyond.

Perhaps even more important to me than the equipment is the fact that, while all the inactivations were occurring, air defense soldiers were always being well cared for. Through a combination of retraining programs, early



by Maj. Gen. Victor J. Hugo Jr.

Commanding General, 32d AADC

returns to the United States and secondary MOS reassignments within the theater, air defense soldiers have always been foremost in our planning efforts. "Soldiers First" is more than a slogan — it's a primary concern for the entire 32d AADC chain of command. Air defense leaders work hard each day to improve the working and living conditions for all of our soldiers; for it is our soldiers who stand watch on the front lines of freedom. Our success in caring for soldiers in Europe is affirmed by our exceedingly high re-enlistment rates and by the thousands of Foreign Service Tour extensions this command processes every year.

Air defenders have seen remarkable improvements in their working conditions and in the quality of equipment provided for their use. But, perhaps our greatest accomplishment as a branch has been the quantum increases experienced by families and single soldiers concerning quality of life issues.



Germany's rolling terrain presents an air defender many challenges when trying to maximize defense of a defended area.



Patriot soldiers are able to emplace their equipment and become fully operational in just minutes rather than the many hours or days Nike Hercules required to displace and set up.

Even though we are experiencing funding reductions, the quality of life of all air defense soldiers and their families continues to improve. For the single soldier, barracks modernization programs and more than \$2 million in new barracks furniture have produced a standard of living unknown to air defenders in Europe just a few short years ago. Two-man rooms, carpeting, color TVs in day rooms, and other conveniences have made the single soldier better off than his peers in the late 1970s. Families also are benefiting from a new Army concern for their welfare. Family centers, one-stop civilian personnel office job centers, greater child-care facilities and spouse support groups are all initiatives which are now beginning to pay big dividends. Since 56 percent of the force is married, concern for families will be an ever more important issue for our Army in the future. I am pleased to report that, here in Europe, Air Defense Artillery is in the vanguard of this important effort.

I would like to share with you one last indication of the vitality of the air defense community — our branch's wholehearted adoption of the regimental concept. Between August 1986 and early 1992, nine air defense regiments will be redesignated or activated. Already, the 1st



Patriot's ability to track and engage multiple targets has significantly increased 32d AADCOM's ability to defend NATO airspace in Central Europe.



Under the BIAD deployment concept, the Hawk batteries Pulse Acquisition Radar has been eliminated, allowing the unit to deploy in two platoon-size assault fire unit elements.

Battalion, 1st Air Defense Artillery (Hawk), has been redesignated as 3rd Battalion, 52nd Air Defense Artillery, and the 2nd Battalion, 62nd Air Defense Artillery (Hawk), has been redesignated 1st Battalion, 1st Air Defense Artillery. These redesignations were necessary to allow the 2nd Battalion, 62nd Air Defense Artillery, designation to be assigned to an air defense unit in the United States.

Additionally, redesignation of our Chaparral/Vulcan battalions will result in all C/V battalions in Europe being assigned to the 44th Air Defense Artillery Regiment by 1988. Adoption of the regimental system will lead to increased unit identification and ultimately greater esprit de corps by all air defense soldiers. Since the future of any branch ultimately resides with its young soldiers and officers, Air Defense Artillery has every reason to be proud of its past and to be confident in its future.

Air defense Artillery is alive and well, and with all these improvements underway, I hope you will agree with me that this is an especially exciting time to be an air defender.



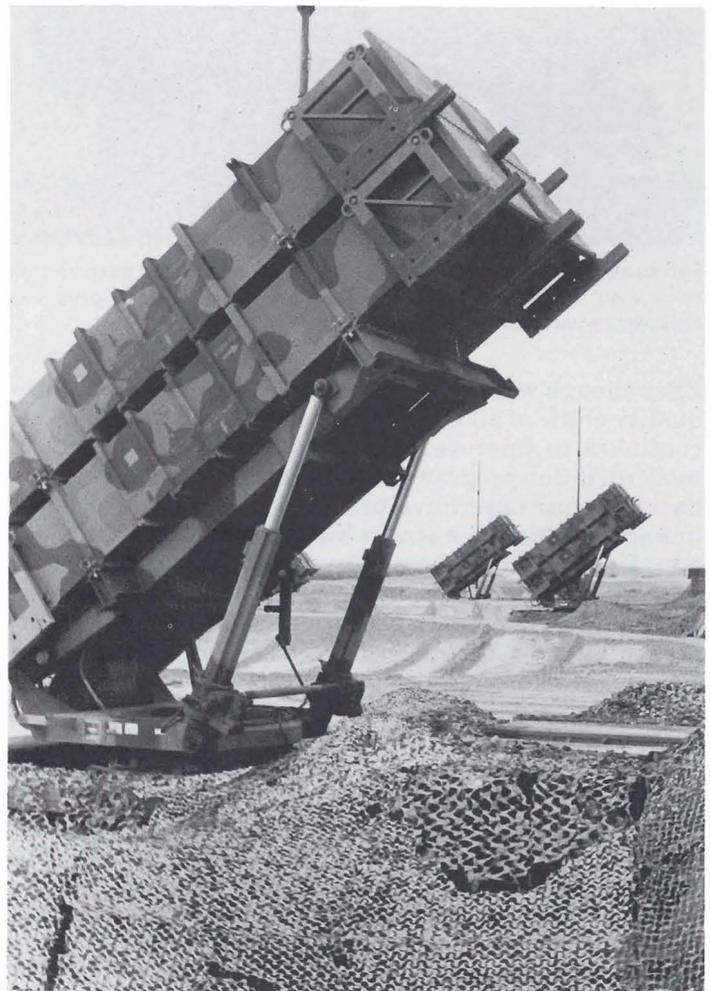
32d AADCOM soldiers continuously hone their skills throughout the year as they prepare to live fire at Crete.

U.S. Patriot in Europe

The first Patriot units in Europe met tough, time-sensitive schedules to quickly win combat readiness certification



Up before dawn, Patriot soldiers are already emplacing their antenna mast group in anticipation of a daylight raid by aggressor aircraft. (Photo by SSgt. P. Durban)



Patriot's high rates of fire and exceptional accuracy would seriously dampen aggressor pilot morale. (Photo by SSgt. P. Durban)

With the arrival of the main body of personnel in January 1985, the 4th Battalion, 3rd Air Defense Artillery, became the first European-deployed battalion equipped with the U.S. Army's newest and most sophisticated air defense missile system, Patriot.

by Maj. John M. Hutchison

Despite the cold, snowy weather, the soldiers of the battalion were warmly welcomed to the 32nd Army Air Defense Command and its host community, Giessen, West Germany, by the 10th Air Defense Artillery Brigade commander, Col. Robert J. Weinfurter. Enthusiasm soared as soldiers were first exposed to the facilities that were to be their new home. The battalion garrison complex was new and filled with modern conveniences. This was especially true of the well-equipped and spacious motor pool. Similarly, the quality of the modern initial readiness positions

(IRPs) were like nothing air defenders had ever experienced before in Europe.

From covered, protected, modern maintenance facilities to state-of-the-art "ready" buildings complete with built-in nuclear, biological and chemical (NBC) protection, these new facilities represented a quantum improvement in the quality of life for the air defense soldier. Never before had air defense soldiers been accorded such first-class accommodations.

However, there was little time to enjoy the facilities as the unit had a tough, time-sensitive, milestone-oriented schedule designed to quickly and effectively incorporate the battalion into the NATO integrated air defense system.

The schedule began with processing the soldiers and their families into the community. Despite a major commitment as a winter Reforger headquarters, the Giessen community accomplished this monumental task in five days. This very efficient operation allowed the battalion to

quickly turn its attention to its first major operation, picking up, shaking down, accepting and signing for its tactical equipment.

Soon afterward, the fire units and battalion operations center (BOC) dispatched personnel to Miseau depot, near Kaiserslautern, to pick up their respective sets of Patriot equipment. Each fire unit was issued the radar set and engagement control station they used in both collective training and Patriot Follow-on Evaluation III (FOE III) back at Fort Bliss, Texas. The BOC also received the information coordination central it used during training. All other Patriot equipment, including launching stations, antenna mast groups, electric power plants, electric power units and communications relay groups were brand-new models.

This was also the first experience soldiers of the battalion had in driving the oversized 10-ton, heavy expanded, mobility tactical truck (HEMTT) with its radar set or launching station in tow over crowded, narrow roads in the extremely adverse weather conditions of winter in central Europe. That this was done without accidents is a testament to the training and ability of the soldier operators of the battalion.

Following processing and brake and load testing, all launchers were loaded with their basic load of missiles. On March 5 the battalion demonstrated all systems in the operational status, both as independent fire units and in the normal integrated configuration for a combat Patriot battalion.

Having met this first critical milestone, the battalion turned its attention to its first tactical requirement, site certification.

The battalion spent four weeks training to the NATO standard for executing its air defense mission from the hardened IRPs commonly referred to as TAC sites. This required extensive air battle training for battalion tactical directors, battery tactical control officers and their fire control crews. In addition, the fire units' proficiency in moving to, occupying positions and emplacing the system on the IRPs was evaluated. The battalion's outstanding performance during the evaluation was due to the hard work and dedication of its soldiers, as well as dedicated planning and training assistance provided by the 10th Brigade, now commanded by Col. Anson W. Schulz.

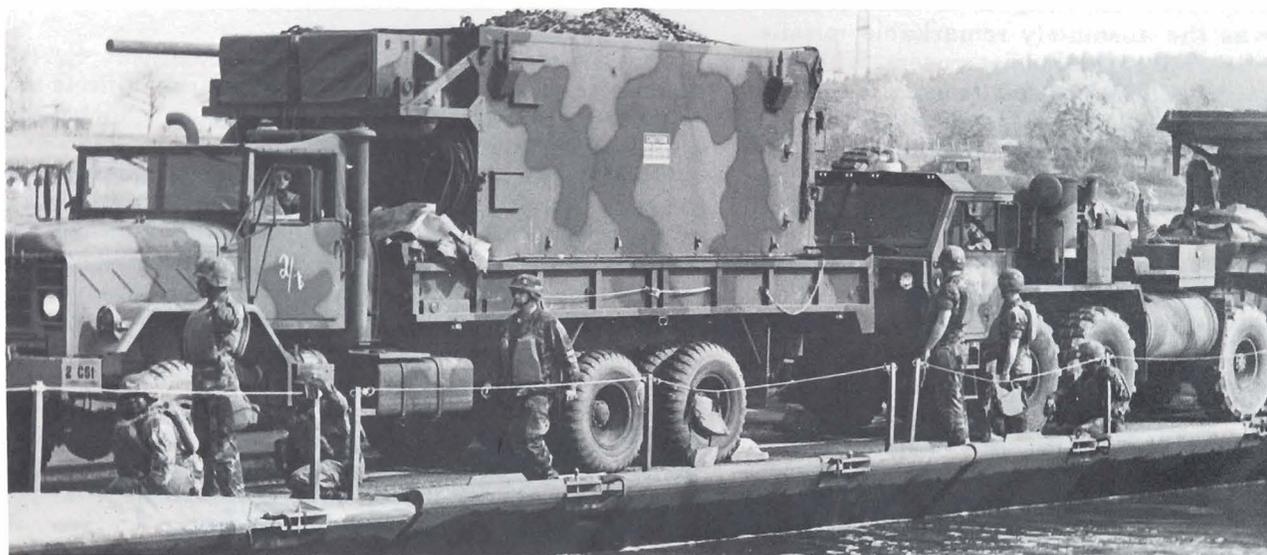
During this same period, the advance party of the second Patriot battalion to be deployed to Europe arrived to begin preparation for the reception of their soldiers in June. The 2nd Battalion, 43rd Air Defense Artillery, commanded by Lt. Col. Johnnie O. Rankin, would have their headquarters in Hanau, about 15 miles east of Frankfurt. This advance party, led by Maj. Roy Gortney, started on the myriad of tasks necessary to receive the battalion personnel and equipment.

Meanwhile the 4/3rd ADA schedule became even more intense. Having demonstrated its site proficiency, the battalion began a series of field training exercises. These field training exercises worked to prepare the battalion to move, occupy positions and sustain combat operations from field locations, the preferred tactical use of the system in the NATO General Defense Plan.

Field training was, of course, nothing new to soldiers of the battalion, having spent more than five months of the previous year in the deserts of Texas and New Mexico during collective training and FOE III. There was, however, a big difference in the environment. After the hot, dry, sandy environs of the desert, the wet, cold, muddy environment of Europe posed new challenges for the battalion. Moreover, the NBC, ground defense, and command and control requirements of NATO air defense forces posed additional challenges.

Concurrent with this next phase of training, the battalion was tasked to conduct a 22-week test designed to provide data needed to determine the most appropriate peacetime state of readiness for Patriot fire units. This exhaustive, comprehensive data collection effort examined all aspects of Patriot TAC site operations. This included all training, individual and collective; maintenance, conventional and system; and, just as important, quality of life for the soldiers. These factors were weighed just as heavily as the more traditional requirements — time, equipment and manning — necessary to launch a missile.

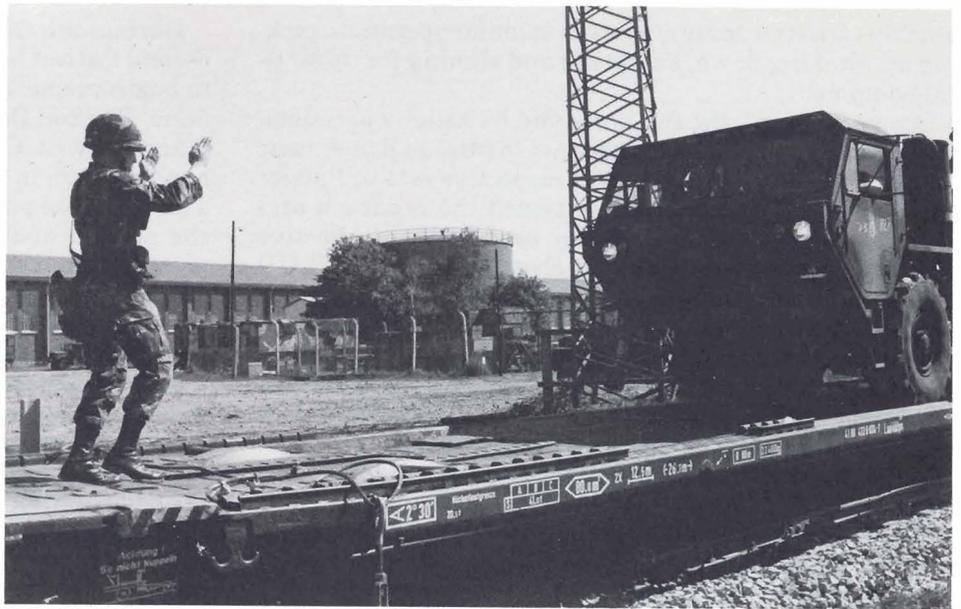
The battalion earned a combat-ready rating by successfully completing its General Defense Plan certification evaluation administered by 32nd AADCOM during mid-summer. This thorough, intense test used the Patriot ARTEP as a base, with additional tasks added to ensure compliance with NATO requirements and standards. The



Members of C Battery, 2/43rd ADA, practice water obstacle skills due to the extensive number of water ways in central Europe. (Photo by SSgt. P. Durban)



No stranger to visitors, 4/3rd ADA hosted Secretary of Defense Caspar Weinberger (left) and West German Minister of Defense Manfred Woerner.



Patriot moves in as the 2/43rd ADA receives its new equipment including this HEMTT.

battalion was challenged by a scenario that drove it from a normal peacetime posture through an initial alert, movement to and occupation of simulated General Defense Plan field positions, to the conduct of combat operations over an extended period of time.

The battalion cleared its last milestone hurdle by proving its ability to meet or exceed the standards of reacting to and sustaining combat operations. Of particular note was that, despite difficult terrain and weather conditions, the 10-ton HEMTT, the prime radar set and launching station mover, was equal to the task. There were no noticeable differences in movement times in Europe compared to those during FOE III.

The commander of 32nd AADCOP pronounced the battalion ready to assume its place as a ready air defense battalion and offered the battalion to the Central Region Integrated Air Defense (CRIAD).

The state of readiness test which had also begun in April continued through early September. The test data gathered, while providing the command the information needed to forward a recommended Patriot state of readiness to the Commander, Allied Air Forces Europe, provided other equally invaluable insights as well. Foremost among them was the absolutely remarkable missile-system-availability rate of the Patriot system. While the exact figures are classified, it is safe to say the combat-available rate of Patriot equipment — individually, as fire units, and as an integrated battalion — far exceeded the standard established in the material needs document as well as the initial acceptable standards set by the battalion FOE III.

The 10th Brigade's attention was not focused solely on 4/3rd ADA, however, for in June the main body of the 2/43rd ADA arrived following their U.S. Air Defense Artillery Center certification and successful live-missile firing in March 1985. Using lessons learned from 4/3rd ADA, the 2/43rd ADA concluded their in-processing by the end of June and entered their own tactical training phases designed to prepare the 2/43rd as the second combat-ready Patriot battalion committed to NATO.

While not any easier, the experience gained by the brigade and 32nd AADCOP during 4/3rd's deployment certainly added to the smooth, efficient transition plan for

2/43rd — eliminating a number of time-consuming false starts experienced by the first unit. In fact, it provided an even more demanding test of 2/43rd's abilities as the now experienced brigade staff knew more precisely what to demand of the second battalion.

The 2/43rd ADA, like the 4/3rd ADA, was more than equal to the task. In fact, they had accepted the equipment as a battalion set, accomplished site certification and passed, with flying colors, their own General Defense Plan certification by December, four days ahead of the 180-day time requirement. Moreover, 2/43rd's experience demonstrated not only its tremendous air battle capability, but further substantiated Patriot's remarkable system-availability.

It had been an important year, not only to NATO and the 32nd AADCOP, but to Air Defense Artillery as well. The deployment of two battalions of the extraordinarily capable Patriot air defense missile system to Europe represented a significant improvement in the NATO Alliance's ability to provide an adequate conventional deterrent in the central region. Moreover, this state-of-the-art system was a very necessary next step in perpetuating the maturity of Air Defense Artillery as a branch of the Army's combat arms.

That the two battalions were integrated into the NATO defense so quickly, efficiently and effectively reflects the professionalism of the soldiers of the two battalions, the 10th Brigade and the 32nd AADCOP.

While much has been done, there remains equally much yet to do. The effective command and control and mobility of the system are aspects of its capability that can be further developed to ensure that the maximum benefit of its air defense capability will be used. The education of our allies concerning the capability of the system is another important on-going action that will bear much fruit in the coming years. With planned software improvements, the deployment of the third U.S. Patriot unit, 2nd Battalion, 3rd Air Defense Artillery, this fall to Europe, and the formation and initial training of the fourth Patriot battalion at Fort Bliss, the 6th Battalion, 3rd Air Defense Artillery, the near future will be as equally challenging as the recent past.

Maj. John M. Hutchison is the 32nd AADCOP G-3 plans officer.

New ADA

'Top' Values

Taking Care of Troops

No, perhaps he really didn't know much about Hawk operations, but it hasn't shown a bit, admitted his battery commander

by Capt. David B. Hamilton

“Sir, I don't know much about Hawk, but I'd like to be a first sergeant.” Those words were uttered sometime last year in my office by a brand new “candidate” for my first sergeant position, MSgt. William F. Mays.

The dream of any company-level commander is surely to have a top-notch first sergeant. Without exaggeration, it makes life considerably easier for a unit commander. There wasn't much, though, that I really knew about this man at the time. I had only been in command about three months myself, and about 45 days earlier my first sergeant had returned to the states.

In the interim, I had been operating with an acting E-7 first shirt. In fact, I had actually already reconciled myself to finishing command with that acting first sergeant. Then one day our battalion command sergeant major told me that he thought he had a man for me. My curiosity was naturally aroused until he told me that this “candidate” was available because he didn't get along with his previous commander. “Oh boy,” I thought, “they're really trying to get just about anybody now.”

The whole situation was strange to me, anyway. Our unit had already won the prestigious Ransom Trophy, certifying our battery, C Battery, 2nd Battalion, 2nd Air Defense Artillery, as the best Hawk triad battery in

32nd Army Air Defense Command (AADCOM), West Germany, an unprecedented four — yes, that's right, four — years in a row. It was obvious to the whole air defense world, not to mention me as a commander, that I was part of a crack outfit with a history of great accomplishments.

During my short tenure as battery commander, however, I had noticed several aspects of the unit which displeased me. These areas all fell under fundamental categories — cleanliness and orderliness of living and working areas, inspecting and checking soldiers and their living areas, and maintenance of unit equipment. In a nutshell, I suppose I could characterize it as a lack of caring. Having been in the Army nearly 14 years, and having worked as a private, an NCO and a lieutenant, I felt I had a good perspective on how units should basically operate.

Having worked in Military Intelligence, Field Artillery and Air Defense Artillery, at least I'd seen my share of good and bad units. By then, I was well on my way toward instituting certain policies and programs (with varying degrees of initial success) in order to improve weak areas. But I realized more each day that, above all, I needed a good, experienced and even tough first sergeant to get the attention of all the non-commissioned officers and to professionally guide them in the performance of their duties. In an environment where it seemed that most lieutenants are viewed more as tactical control officers than platoon leaders, I had my hands full just trying to

convince my officers that fundamental leadership principles had never gone out of style.

The acting first sergeant was well-intentioned and trying to do his new job as best he could. It wasn't easy, though. He had known and worked with most of the other platoon sergeants for a long time and had “grown up” with some of them. I wasn't willing to compromise my standards and now I wanted them enforced, and, honestly, it wasn't always easy for the acting first sergeant to do what was directed. He was just better suited, at that particular juncture in his career and in this particular unit, to be a platoon sergeant. I really think that part of the problem too was a genuine feeling on the part of the NCOs that they were already taking care of their end of the bargain, since the unit had enjoyed so much success during major tactical and technical evaluations in the past.

Anyway, there I was talking to the CSM about this first sergeant “candidate” in the battalion parking lot. Frankly, I wasn't encouraged but agreed to interview MSgt. Mays.

He appeared in my office on that day as any E-8 seeking a first sergeant job might — uniform sharp, boots incredibly well shined, and exuding military bearing and courtesy. He explained to me that he had been a first sergeant in the new Patriot air defense battalion recently fielded in Europe, but that when his unit underwent a change of command, the incoming commander had expressed a preference for someone

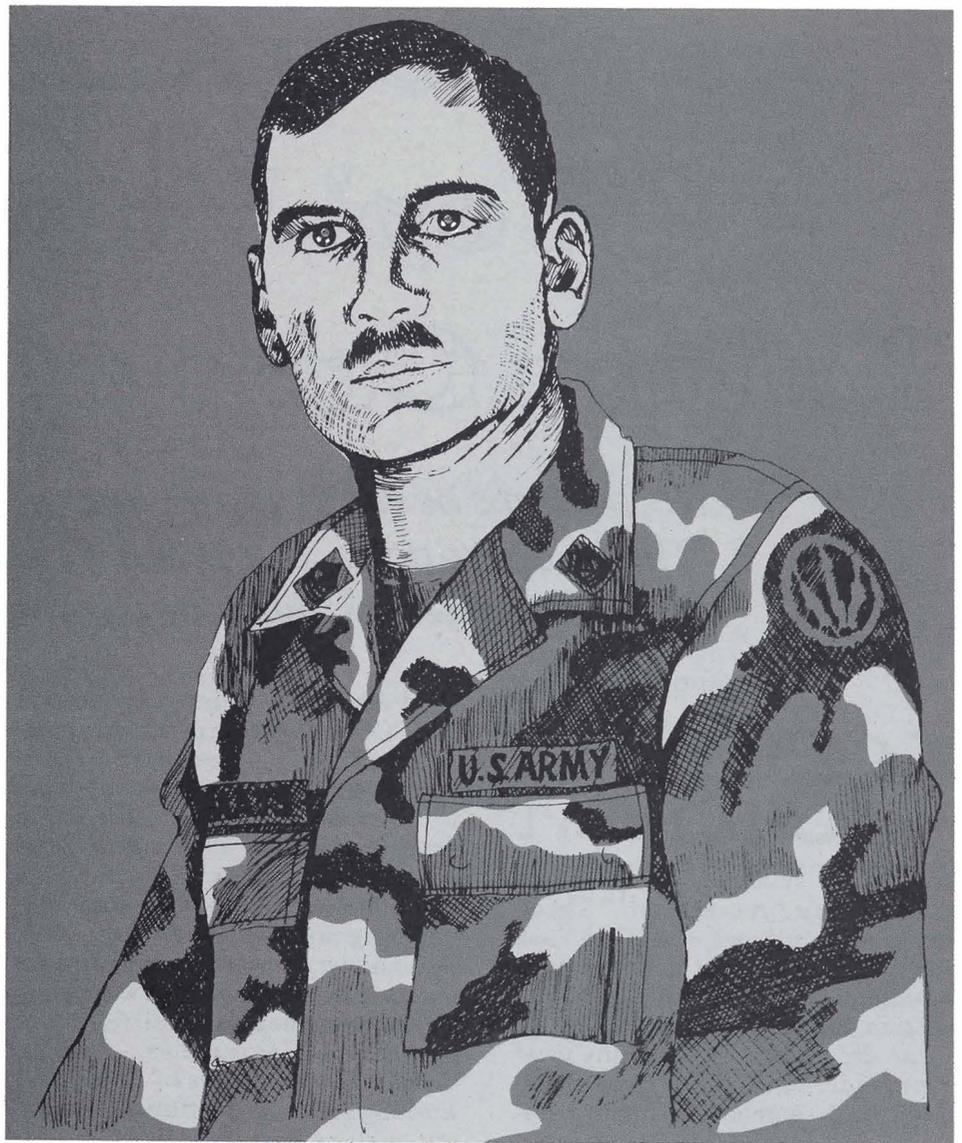
of his own choosing to fill the job. He also explained, in an unceremonious matter-of-fact style, that he was scheduled to attend the U.S. Army Sergeants Major Academy the following year and that, in the meantime, he had no desire to be a master sergeant working on a staff. He wanted, instead, to keep being a first sergeant.

“Interesting,” I thought, as he expounded on some more of his credentials. I then began explaining to him essentially what my philosophy of command was and what I needed a first sergeant to do in my unit. It was quite remarkable, really, how much we seemed to have in common. We both were firm adherents to the NCOs running the unit, to taking care of soldiers, to training effectively, to dedication to high standards, and to earning the confidence and respect of our soldiers.

He seemed to voice support for every leadership trait I hold dear and, moreover, did so without the slightest trace of forcing his verbiage. I believed that he meant what he was saying. Although still somewhat skeptical, I told him that he could start to work the following week.

No sooner did 1st Sgt. Mays come to work that first morning, than there was an alert and another major tactical evaluation. As can be imagined, the tactical air command (TAC) site and billets were whirlwinds of motion and activity. The poor first sergeant probably hadn't learned the names of the platoon sergeants yet. Anyway, the dust settled and the battery came out of the evaluation looking great, as was the norm. Now the unit had a chance to settle in and take a look at its latest addition to the leadership, the first sergeant.

I suppose I got the first hint of a change in the status quo when I came to work and saw a young private painting the front steps. Ordinarily, this wouldn't surprise me except for two striking reasons. First, the private was the recipient of multiple Article 15 punishments at battery and battalion, pending a Chapter 14 discharge and, generally speaking, one of the worst and least productive soldiers I've ever seen. Second, I had never stopped to imagine what a new coat of paint would look like on those faded and weather-beaten steps. The steps just seemed to blend in perfectly with the rest of the rather dreary building facade.



“Well,” I thought to myself, “if the first sergeant accomplishes nothing else, he's done something no one else has been able to do — get that private to do something constructive.” As it turned out, it seemed that the same private was working on a new project every day and never complaining. I thought there was a trick to it somehow, but the first sergeant always made sure the private knew what he wanted, that the private was resourced and supervised, and he praised the soldier for a job well done. I even saw the first sergeant out raking with a hoe once while instructing the troop exactly how he wanted a job to be accomplished. It appeared that, perhaps, this was no ordinary NCO.

It wasn't unusual for me to arrive earlier than the previous first sergeant each morning, but I couldn't seem to do it with the present one. Finally, one morning, I came in early and he wasn't there. I began to have

a feeling of self-accomplishment. When an hour or so had elapsed and there was no sign of life in the command section, I really was set to chide the first sergeant for “sleeping in.” I asked the CQ if he had seen “Top,” to which he replied, “Yes sir. He and the other NCOs have been in the dayroom since 0600 this morning for NCOPD [NCO professional development].”

I almost fainted. After I had studied the first sergeant's “modus operandi” more carefully, I came to find out that he conducted NCOPD quite often. Usually his guidance to the NCOs came under two headings: standards and caring. It was becoming more apparent that this was no ordinary first sergeant.

I began to notice subtle changes in the NCOs as well. They actually sought out the first sergeant so that they could learn more and discuss certain problems. The first sergeant's easy, personable style seem-

ed to relax them and, at the same time, get their attention. He appeared to have no problem in convincing the NCOs that, if they wanted to be professionals and have the authority to run the unit, he would back them and guide them 100 percent. The NCOs had more pride now and 1st Sgt. Mays was constantly involved in building it. In the first sergeant's absence, the platoon sergeants would aggressively band together and come up with well-thought-out plans in order to ensure that any mission was smoothly accomplished while soldiers were treated equitably.

At times, the ship would start to rock a little bit, but once the first sergeant came onto the scene the most complex of operations seemed simple. For example, there was a considerable amount of upheaval and confusion when our guard requirements escalated due to terrorist activity. Combined with CQ, unit patrol and manning requirements, it seemed that roster after roster was being generated on a daily basis by the platoon sergeants. When 1st Sgt. Mays took stock of the requirements, he prescribed clearly and fairly what should be done, by whom and when. It seemed that, for someone who didn't know much about Hawk, he wasn't having much of a problem incorporating his plans into effective schemes of maneuver.

Every now and then, when I wasn't distracted by the business of the day, I began to notice other changes. My office floor was brightly shined, office supplies would mysteriously appear on my desk (all perfectly laid out, as if prepared for inspection), my office baseboards would suddenly be meticulously painted, curtains would be hung properly, and washrooms would have plenty of the essentials.

There was more. The eyesore of a bulletin board was revamped. Unnecessary boards were taken down and framed pictures of the chain-of-command all the way up to President Ronald Reagan were hung neatly side-by-side in the hallway. The grass seemed always to be cut (Where could the lawn mowers possibly have come from?), hedges were neatly trimmed, steps were painted, and even a new sign was hung over the front door which prominently displayed the names of the first sergeant and myself.

I noticed I was beginning to feel

more pride, too. I had spent much time listening to how we were the best battery. Now I was beginning to feel like it. But why? Maybe I was just taking it for granted that everyone had finally decided to follow the new policies I had written. Then one day I opened my suggestion box attached to the wall outside my office. It allows the soldiers who may wish to suggest a better way of doing something, but who would rather not talk to me directly, an opportunity to give me input and feedback.

I enjoy reading what my soldiers have to say, so I began unfurling the collection of folded-up notes. One young soldier had sent me a note to the effect that the first sergeant was good for the unit. He was right. In reflecting, I could clearly see so much that the first sergeant had accomplished in such a short time.

The first sergeant had wasted no time in ensuring that our unit dayroom was properly cleaned, equipped and organized to the point where it was unquestionably a showpiece dayroom. A meeting for the new CSM of 32nd AADCOM with the battalion CSM and first sergeant was scheduled in the same dayroom. I took it for granted. I shouldn't have. When I walked through the billets for the quarterly battalion command inspection, I was stunned at the difference between what I saw and what I had seen during the last command inspection.

“
**He had no
hesitation
about fighting
for his troops.**
”

The beauty of it is that the billets and TAC site are always ready for any visitor or inspection. It was not uncommon at all for the first sergeant to conduct an inspection of the TAC site on late Friday afternoons. The troops could see the difference, too. That was why that note appeared in my suggestion box.

The NCOPD sessions with the platoon sergeants continued, and soon even the CQs were being taught precisely what the first sergeant wanted. Dramatic changes continued to occur. “Projects” were regu-

larly assigned to each platoon by the first sergeant, and visible improvements kept becoming apparent.

On top of all of this, I realized that whenever I asked the first sergeant to do something, it was always done — not most of the time, but always.

First Sergeant Mays' genuine concern for the troops never abated. When it was brought to his attention that troops on our TAC site were not receiving the meals they should, he personally got involved with the dining facility sergeant and platoon sergeants to ensure the situation was remedied. He continued to teach his NCOs to check and perform their various duties.

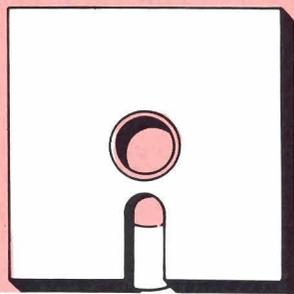
Whenever it was time to go to bat for the soldiers, the first sergeant was always there. He had no hesitation about fighting for his troops. When soldiers were required to pull various duties during the holiday period, he intervened by requesting relief for soldiers because of multiple detail commitments within the community, and also made sure that soldiers were allowed to be with their families.

First Sergeant Mays is a man who could already have retired and closed the book on a career filled with professional accomplishments and examples, but who has, quite fortunately for the Army, elected to extend his brilliant career and continue to have a great impact on so many other soldiers with whom he served. One can learn a great deal from a man such as this. When General John A. Wickham Jr. wrote his eight precepts of leadership and referred to the critical importance of a leader being a mentor and how one should strive to make a difference — make one's service count — he must have envisioned the same kind of rare ability and leadership which have distinguished the careers of such men as 1st Sgt. Mays.

No, perhaps he really didn't know much about Hawk operations, but, to date, it hasn't shown a bit. He only wanted to remain a first sergeant and was completely confident that he could meet every challenge which confronted him, as well as teach others to provide the means for better mission accomplishment and for taking care of soldiers. So far, he has done precisely that.

Capt. David B. Hamilton turned over command of C Battery, 2nd Battalion, 2nd Air Defense Artillery, at the end of September and is awaiting reassignment.

Solving Software



Maintenance

by Raymond Day

software support (LCSS).

In support of one of these studies, information was required on the software change history of a U.S. Army system covering a representative span of time in the operational and maintenance phase of the system's life cycle. Such information would assist Army planners at the U.S. Army Missile Command (MICOM) in formulating software maintenance concepts for a new approach to LCSS. The desired type of information concerned the quantifying of resources used to produce the various changes that were made during the maintenance process. A "model system" was to be identified for investigation that would be representative of a type system that would be the maintenance responsibility of MICOM.

Based on these primary considerations, the air defense artillery automated command and control system, the AN/TSQ-73 "Missile Minder," was selected for this investigation.

The Missile Minder represents a mature and stable high-technology system that has been in a tactical "user" environment for several years. More than 300 separate software changes were investigated during the study to determine the nature of each change, type of defects that were corrected as well as other documentation.

The AN/TSQ-73 system made the

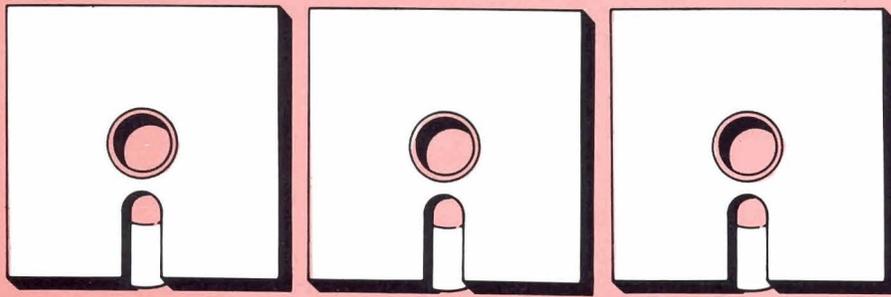
transition from the developmental to the operational and maintenance phase of its life cycle in the late 1970s. Software responsibilities shifted from the developing contractor's commercial facility to a government software maintenance facility supported by another contractor. The system is used by the Army to provide centralized weapons allocation and command and control functions for medium- and long-range surface-to-air missile units such as Hawk and Patriot.

The software maintenance tasks of deficiency analysis, system engineering, software design, coding, documentation changes and testing are performed by a contractor's staff within the software support center. The government has a management and technical staff that performs required contractor monitoring functions and also has independent product assurance responsibilities, such as configuration management, software quality assurance and system testing.

Each software version that is baselined by the Army has a detailed and comprehensive engineering change proposal (ECP) package that must be given final approval by the responsible configuration manager. The ECP package contains information regarding every facet of each software change that was made to the existing software baseline. This information is contained

Software is the brains behind

much of the Army's combat muscle, but software maintenance continues to cause major problems in many of today's systems. The U.S. Army is an active participant in various studies seeking a better understanding of the software maintenance process. The hope is to develop new approaches to optimize costly life cycle



Problems

in documents that provide a history of each change with all the technical information required to fully explain what was changed, why the software was changed, what modules were affected, who tested the change, how it was tested, what were the test results, what documentation was changed and what government quality-assurance personnel witnessed the testing. The primary document that initiates a software change is called a computer program engineering change request (CPECR).

The last four years of change history was determined by auditing the last three ECP packages. These packages had more than 300 changes associated with them; each change documentation package was investigated to obtain the required error information. Because of software configuration control documentation, it was possible to make a major subdivision of the effort that was expended by the contractor's technical staff into three main areas.

The first area was software design, coding and testing. This general area could be further divided into latent error corrections and improvements made to the software because of user requirements. The available error documentation allowed errors and corrections to be categorized such as: system processing, automatic data link, man-machine interface and others.

The second area was documentation. Some change requests were initiated because of apparent errors in the original system specifications or because some changes caused corresponding changes to the specifications. In some cases, technical manuals provided to the user and maintainers of the system were found to be incorrect. In these cases, correct technical information based on the operation of the current software version had to be developed.

The last major area identified was requested changes investigated and withdrawn. Every change request that is formally submitted must be completely investigated and verified before being accepted by the Software Configuration Control Board as an approved change. In many cases, the reported software error cannot be replicated in the laboratory or perhaps it is discovered that the reported software error may have been nothing more than an operator procedural error.

The data maintenance base investigated represents about four years of effort of supporting a mature and stable system in a tactical environment. The total division of contractor software maintenance resources expended over this period is shown at Figure 1.

It can be seen that the vast majority of effort has been to support user-driven improvements to the system. This change history is understandable

when the nature of the system and its environment is considered. The environment is in a constant state of flux because of technological advances that create system improvements, change interface requirements, modify air defense artillery tactics and doctrine and increase user sophistication with the system.

Some of the improvements have been of such a magnitude as to cause a "mini" software development effort while the system is in the maintenance phase of the life cycle. The history of

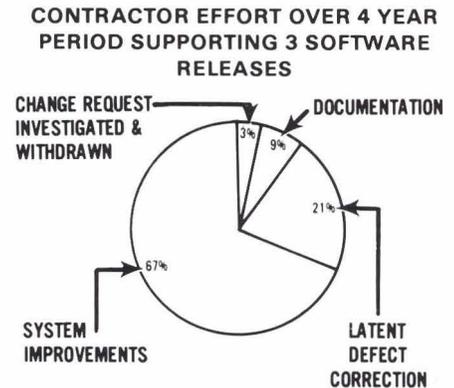


Figure 1.

this system reaffirms the validity of the iterative life-cycle process — the software of a system such as this continues to recycle through each phase of the life cycle. This implies that staffing considerations for software maintenance support should consider this phenomenon. Software maintenance organizations must be adequately staffed with the required technical personnel to accommodate the dynamic nature of the Army battlefield automated system (BAS) environment.

As stated previously, system improvements made up the majority of the support contractor's resources during the maintenance process, and could be separated further into six primary categories of effort. These six categories and the percentage of contractor resources expended in each are shown in Figure 2. This history of software changes to support new system capabilities may be a realistic model for future Army BASs. After being operational for more than six years, a requirement was developed for the AN/TSQ-73 to interface with an entirely new air defense artillery system, Patriot. The new system capability required a complete redesign of portions of the software and generally had substantial ripple effect through the complete software architecture and system documentation. Extensive requirements for testing of the new system

capability placed an additional burden on the already over-committed support organization.

As the user became more familiar with the system, numerous suggestions to improve it were formulated. Although the software was initially developed to specified requirements, in some areas these requirements did not accurately reflect the user's desires, while in other cases the user changed his mind between the time the requirements were first formulated and the time he received the system. Considerable resources were expended on the optimization of existing codes, and this may be unique to this maintenance environment. Soon after the system was declared operational, all its available computer memory was being used for the tactical computer program. When high-priority improvements were required by the user, the software maintenance staff had to "free-up" memory to make these changes. This involved taking lower priority processing functions out of the program or redesigning portions of the code for more efficiency and less memory requirements.

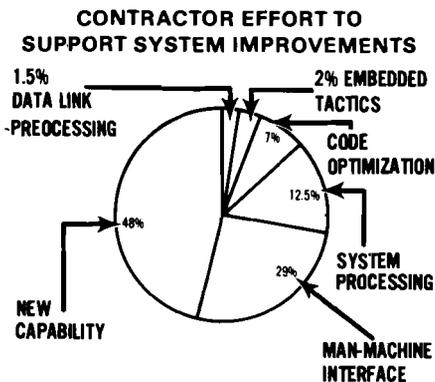


Figure 2.

As reflected in Figure 1, correcting latent software defects accounted for about 21 percent of the total support effort over this four-year period. Latent defects that are discovered by tactical units in the field are reported on a special form called a Quality Deficiency Report. Observed deficiencies may be caused by system hardware, software or a combination of both. When deficiencies are software related, a CPECR is written which fully describes the defect and is also used for configuration identification and accounting purposes.

It is interesting to note the apparent impact that incorporating new system capabilities has upon normal software maintenance activities. Figure 3 indi-

cates that the majority of latent system defects are occurring in the area of system processing. One would then rationally expect the major thrust of the software improvements to be directed in that area; however, this is not the case. Figure 2 shows that only 12.5 percent of the system improvement effort is directed toward system processing. The indicators are that software related to system processing presents a quality problem that cannot be fully addressed because of higher priority requirements.

EFFORT TO CORRECT LATENT DEFECTS

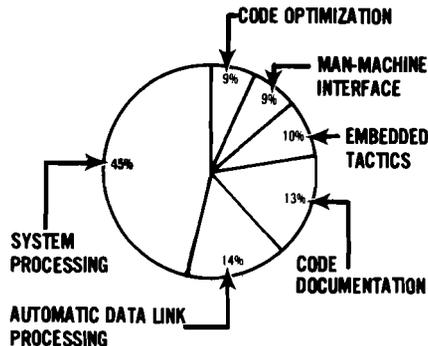


Figure 3.

Based on the analysis of the accumulated maintenance data developed in this investigation, coupled with observations of the maintenance environment, certain conclusions were developed that may assist software maintenance planners confronted with a similar environment.

Type of Software Change Activity

Operators of complex automated systems that interface with a variety of other similar systems can expect an inordinate amount of software activity related to system improvements. These improvements are required to ensure interoperability with other netted systems that are also experiencing changes, and to modify the functioning software to satisfy evolving user requirements.

Many of these improvements are caused by the incorporation of new system capabilities that were not required when the system's functional requirements were first developed. This particular system must be sensitive to new technological advances, changes to the enemy's capabilities and corresponding adjustments to U.S. Army changes in air defense artillery tactics and doctrine.

Iterative Life Cycle

Continual recycling through all phases of the traditional software development cycle is a way of life in this

project. Government and contractor personnel assigned to this type of maintenance activity must be familiar with the total life cycle software process and current software engineering practices. In addition, government maintenance plans and procedures must have sufficient coverage of developmental related software events even though the system is technically in the maintenance phase of the life cycle.

Testing

On this support program, testing is the major consumer of resources within the change areas described. The standard 40-20-40 rule of thumb used in the industry does not apply in this environment. Instead the experience has been:

- 35 percent analysis and design.
- 15 percent coding.
- 50 percent testing.

The testing problem is caused in part by the large amount of system improvements that have been made to the software and the lack of automated testing tools. In many cases, these changes require extensive interoperability testing. Also, before a software version is accepted by the user, it must go through a series of certifications and user-acceptance testing that is beyond what is normally expected in a software maintenance environment. Although some of these tests are conducted by the government, they all require contractor support.

Error Data Collection

There is no effective error data collection and analysis mechanism in place to determine the measurement of productivity and quality factors for each successive software version. Without this error data, trend analysis is not being performed to identify existing and potential weaknesses in the software that require corrective action. It is not presently possible to demonstrate quantitatively that the effectiveness of the quality process is improving with each successive version release.

As software professionals throughout the government are seeking a better understanding of the software maintenance process, this study conducted on the AN/TSQ-73 will help improve present techniques and methods. This study is an aid in developing new approaches to optimize costly life cycle software support.

Raymond Day is director of the air defense artillery command, control and communications, and intelligence programs with INTERCON Systems Corporation.

The New Look of Hawk

by SFC Lawrence Leach

Drastic changes

to the Hawk equipment structure have caused major changes to be made within the Hawk personnel structure.

The Office of the Air Defense Artillery Proponent, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has sent these suggested changes to the Department of the Army.

★ Eliminate military occupational specialty (MOS) 24E, Hawk Fire Control Mechanic, due to the deletion of the battery control central (BCC), pulse acquisition radar (PAR) and range only radar from the Hawk Line units. (There is a staffing action in progress to add the PAR and BCC to MOS 24G, Hawk Information Coordinator Central Mechanic, since Forces Command units will retain the PAR and BCC.)

★ Eliminate MOS 26H, Air Defense Radar Repairer, due to the deletion of the AN/TPS-1G, Air Defense Radar, and the transfer of direct support/general support maintenance on the identification friend or foe (IFF) to Ordnance.

★ Add operational and organizational maintenance on the PAR and IFF at the battalion operations center responsibilities to MOS 25L, AN/TSQ-73ADA Command and Control System Operator and Repairer.

Also, the MOS 24C, Hawk Firing Section Mechanic, will cap at staff sergeant and transition to 24R, Hawk Master Mechanic, at the sergeant first class level. Upon selection to SFC, the 24C, Hawk Firing Section Mechanic, and the 24G, Hawk Information Coordination Central Mechanic, will attend their respective 24R transition course. The auto-

matic award of MOS 24R upon promotion will be discontinued. Formal school attendance will be required for award of MOS 24R, Hawk Master Mechanic, in accordance with AR 611-201.

Due to the elimination of MOS 24E, Hawk Fire Control Mechanic, the additional skill identifier (ASI) G6, Radar Engagement Simulator AN/T PQ-29, will be changed to an ASI for MOS 24C, Hawk Firing Section Mechanic.

The reduction of Hawk fire control equipment requires reducing the number of authorized personnel in MOS 16E, Hawk Fire Control Operator. At this time, personnel in MOS 16E are authorized to request reclassification into another MOS.

All of these proposals will affect Hawk ADA soldiers. And as a reminder, the word "improved" has been dropped from everything pertaining to Hawk.

RECONFIGURED HAWK BATTERY

ASSAULT PLATOON

PLATOON
COMMAND POST



HIGH POWER
ILLUMINATOR



CONTINUOUS WAVE
ACQUISITION RADAR

LAUNCHERS AND
MISSILES



ASSAULT PLATOON

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HIGH POWER
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CONTINUOUS WAVE
ACQUISITION RADAR

LAUNCHERS AND
MISSILES



Hawk Battalion Tactical Operations Center! Is More and Fancier Really Better?

by Maj. Martin W. Leek

Enemy aircraft are penetrating into the rear area, Hawk batteries are engaging friendly aircraft, and the air defense coverage has not been alerted to cover the maneuver brigade's new position.

These problems aren't supposed to occur on the battlefield, but chances are they will. Their cause will likely be traced to inefficient battalion tactical operations center (BTOC) work.

As the brain of the air defense artillery battalion, the BTOC is responsible for assimilating, analyzing and providing essential information and directions to the striking arm. The BTOC must operate efficiently if the battalion is to effectively perform its air defense mission. Deficiencies discovered during evaluations may cost the battalion time set aside for further training, but mistakes during combat will cost lives.

In the continuing effort to achieve the level of efficiency required to ensure success in combat, I will point out a possible method of eliminating BTOC inefficiencies through a cyclic approach of evaluations, streamlining exercises and re-evaluations. It is based on 12 years of experience as a tactical operations center evaluator and operator in both CONUS and NATO for various air defense artillery weapon systems. It is not my contention that all BTOCs are inefficient or that little thought has gone into BTOC operations and the selection and use of equipment and personnel. To the contrary! What I suggest is that many can be improved.

Current Procedures Evaluation

The first step in eliminating problem areas in BTOC operations is to evaluate current operating procedures. Most evaluations and after-action reports deal with symptoms rather than causes. Consequently, the unit expends much energy in correcting the symptoms and never truly evaluates the causes. I have found that most problems within the BTOC stem from an improper assessment of current mission requirements, poor battlestaff manning, faulty communications, and too many maps and charts. Dissecting the BTOC operations into these areas, evaluating each area individually and then conducting an evaluation of the total entity often leads to startling discoveries.

Any additional operation requirements placed on the BTOC which are not established by mission requirements, higher headquarters or supported unit needs can lead to inefficiency in primary mission operations. Overmanning the battlestaff due to a perception that more is better, a belief that poor individual training can be circumvented by having more people, or inefficient management planning add confusion to an already stressful situation. Processing data, ranging from personnel problems to weather conditions in Russia, ties up personnel, communications and time. Finally, improper or ineffective communications systems maintenance and poor communications

procedures impede critical message transmission and proper data flow.

Though some of these points may be oversimplified or exaggerated, they show the need for an effective evaluation of current operations with an eye toward eliminating distractions and streamlining operations.

Streamlining Operations

The goals in streamlining are to ensure that requirements have a "real world" need, that their absence would adversely affect mission accomplishment, and that the training conducted during peacetime will be the same as the operations required in combat. After analyzing typical operations of numerous BTOCs, I think that emphasis should be placed on some worn cliches which include "Getting back to basics" and "Keep it simple, stupid." Rather than dealing with the symptoms that appear in Army ARTEP or FTX after-action reports, concentrate on the causes and try to streamline the operations to eliminate them.

Like most Army officers, I receive little benefit from individuals who are willing to point out problems without providing some suggestions for improvements. Whether or not the following suggestions are helpful, they are a good place to start in reorienting the BTOC.

The first step in eliminating non-mission essential requirements or functions is to establish a BTOC mission list. The Hawk ARTEP lists specific requirements for a generic Hawk battalion under the training/evaluation standards for Tasks 3-1-1-1 through 3-1-3-16; 3-1-7-1 through 3-1-8-12; and 3-1-12-1 through 3-1-12-8. These requirements should be placed on the mission list first, followed by specified or implied missions generated by the theater deployment mission, if they are in addition to those found in the ARTEP. Finally, those requirements from higher headquarters, installation or supporting agencies should complete the mission list. I suggest the current battalion SOP be used sparingly since it is the guideline for current operations and covers situations which may change.

Secondly, in a brainstorming environment, with the tactical and administrative experts from all supporting and supported units, eliminate all non-essential missions — those that do not provide for or improve the unit's ability to effectively shoot, move and communicate. This should equate to about 20 percent of the list.

Next, take the list of requirements and make them a functional area of responsibility for a staff section. Many requirements will bleed over into other staff sections, but each function should be specified to ensure the requirement is fulfilled and each section understands the extent of its responsibility.

Finally, post the list of requirements and responsibilities in a prominent area and refer to it when conducting BTOC operations. If a function isn't on the list and can't be otherwise justified, don't do it. Periodically check the list against the SOP. Remember, you have spent long

hours making, justifying and verifying the list, so change the SOP rather than the list.

The remaining steps in streamlining requirements and functions are relatively simple and are cyclic. Test the streamlined operations list through exercises, make sure that all contingencies are covered, evaluate the exercise, and add or subtract from the list those functions not included, or included but not required. Then, start the cycle over again. Always keep in mind that more is not necessarily better, and that the primary goal is to include only those requirements that add to mission accomplishment. With the requirements established and function designated, it's easier to streamline the number of personnel and amount of equipment allocated to the BTOC.

Battlestaff

Now that the requirements are outlined, it's time to look at the minimum number of personnel needed to perform the listed functions. There is as much diversity in battlestaff manning as there are Hawk battalions. The battlestaff rosters all have one thing in common — they are based on someone's opinion. The correct manning for your BOTC is what works efficiently within the constraints of personnel available, training statuses and doctrine. The higher the headquarters, the more the responsibility; therefore, the TOC at the battalion level should be able to effectively function with relatively few people. The following list is a baseline for minimizing the number of personnel required in each shift.

POSITION	JUSTIFICATION
BTOC Coordinator (Bn XO/S-3)	<ol style="list-style-type: none"> 1. Bn XO or S-3. 2. Strategically placed for access to all displays and ease in all functions of the BTOC. 3. Supervises and ensures proper coordination. 4. Responsible for data evaluation, distribution and coordination during decision making, resolution of conflict and overall operations. 5. Must be well versed in all aspects of battalion operations and be given the authority to carry out decisions and operations.
S-3 (Officer, NCO, Clerk)	<ol style="list-style-type: none"> 1. Assistant S-3 officer responsible for evaluating and analyzing data affecting battalion operations, preparing operations estimates and making recommendations to the BTOC coordinator for current and future courses of action based on current situations. 2. Senior S-3 NCO responsible for encoding, decoding, analyzing and distributing message data. Responsible for BTOC deployment and setup. 3. 16H junior NCO responsible for message transmission, receipt, prioritization and ensuring proper communications maintenance and procedures.
S-2 (Officer or NCO)	<ol style="list-style-type: none"> 1. Staffed by one officer or NCO. 2. Responsible for receipt and transmission of spot reports, weather and terrain analyses and updates of enemy situation for use in intelligence estimates.
NBC (Bn NBC NCO)	<ol style="list-style-type: none"> 1. Staffed by the battalion nuclear, biological and chemical NCO.

2. Should be collocated with the S-2 for communications assets and enemy data updates.

3. Responsible for NBC reports, analyses, estimates and immediate responses required by enemy NBC actions.

S-1
(Officer and NCO)

1. Officer is responsible for analyzing current personnel levels, ensuring adequate replacements, supervising and ensuring proper procedures for other S-1 activities, and providing the S-1 estimates for decision making.

2. The NCO is responsible for receiving, transmitting and ensuring the accuracy of personnel and administrative data. Provides expertise to the S-1 officer.

S-4
(Officer and NCO)

1. Officer is responsible for analyzing current equipment levels, supervising and ensuring proper resupply and providing logistic estimates for decision making.

2. NCO is responsible for receiving, transmitting and ensuring the accuracy of logistic data. Provides expertise to the S-4 officer.

Battalion
Readiness Center
(Officer or NCO)

1. Staffed by officer or NCO well versed in equipment requirements, direct support procedures, and availability of outside support agencies.

2. Responsible for ensuring operational readiness, effective repair operations and advising the commander on reconstitution procedures.

Plotter/Teller
(NCO or enlisted soldier)

16H enlisted soldier well versed in map reading, military symbology, report formats and displays, and able to write neatly, add and subtract and discover errors in mathematics.

*Communications/
Electronics Section
(Bn CESO)

1. On call only. Not manned in the BTOC.

2. Responsible for planning and evaluating communications requirements in support of the mission.

3. Primarily involved during unit moves, catastrophic failures or jamming that affects the mission.

*The communications officer need not be assigned to the BTOC since normal operations and maintenance should be conducted by the battalion headquarters communications section. He is more effectively used in coordinating and evaluating communications equipment and procedures throughout the battalion by liaison visits with the fire units.

The list does not intend to indicate all of the functions or variables in deciding who should man the BTOC. The list does indicate that a BTOC can efficiently be manned and operated by 12 soldiers per shift (see Figure 1 for personnel setup). Some of the soldiers currently manning battlestaffs are used for ancillary functions that are not combat requirements and should be eliminated. Effective training, the elimination of unnecessary requirements and allowing one individual to perform more than one function will allow us to streamline BTOC battlestaffs into a smaller, more effective and more cohesive group.

You should now feel comfortable with the streamlined requirements and battlestaffs; therefore, it's time to direct our attention to the types of displays used in BTOCs and the information they provide.

Displays, Charts and Maps

The more displays, charts and maps that adorn BTOCs, the more time soldiers have to spend maintaining accurate and updated information. The key variables to consider are: Is the information required? Does the information need to be viewed by everyone, or can it be maintained in a binder at the section level? Is the structure of the display functional and easily understood, or have frills been added to enhance the visual pomposity of the array? I'm not saying that charts and maps should not be neat and clean, but when added "ribbons and bows" distract from the primary purpose of the displayed information, you have a problem. As with battlestaff manning, the following list is a suggested baseline for minimizing the requirements for maps and charts.

DISPLAY	FUNCTION
Tactical Situation Board	Used to display current mission, SAMSTAREP, STO, ACO, alert status, alert authority, air raid warnings, special measures, attack alarms and other information affecting staff operations.
Log/Admin/Personnel Situation Board	Used to display equipment status and equipment battle losses (missile peculiar and conventional) and personnel status and personnel battle losses.
Tactical Situation Map	Used to display current and proposed unit locations, approved movement routes, logistic and resupply points, and other information required for staff operations. (Logistical and resupply information should be placed on overlays and used as required.)
Intelligence Map	This map should cover all areas of interest and should display NBC situation, enemy situation, forward line of own troops, fire support coordination lines, air defense coverage, current and proposed area control operations data, and other information required for staff operations. (Air defense artillery coverage and ACO information should be placed on overlays and used as required.)

Considering the need for rapid access to information and the abundance of data that flows through the BTOC, charts and status boards are essential when evaluating future courses of action. The four displays suggested should be placed in front of the BTOC so all soldiers can use the information. It should be maintained by the plotter/teller (for an example of placement, see Figure 1).

Information other than that discussed is probably not critical for viewing by the entire BTOC and should be maintained at section level for use when required. This not only makes good sense, but is suggested in the Hawk ARTEP. The training/evaluation standard for Task 3-1-2-1 says, "Maps and status boards [or information charts/boards set in three-ring binders] are set up . . ."

In my opinion, the bottom line should be that information is not displayed unless 50 percent of the BTOC needs the information to operate and uses the information at least once every two hours. Less information posted equates to fewer soldiers and time required to post the data. It helps meet our objective of using soldiers and manhours only on mission-essential operations.

Communications

Efficient maintenance and use of communications is the lifeblood of the BTOC. There should be no question that the receipt, analysis, use and dissemination of information is going to be difficult without effective communications. I cannot hope, within the context of a few paragraphs, to establish procedures, delineate policies or govern communications-electronics operations for a battalion. I will provide what I consider to be a good example of a BTOC communications setup and try to explain the advantages of some key points. Since a picture is worth a thousand words, refer to Figure 1 where this information is diagrammed.

Key to Communications Setup

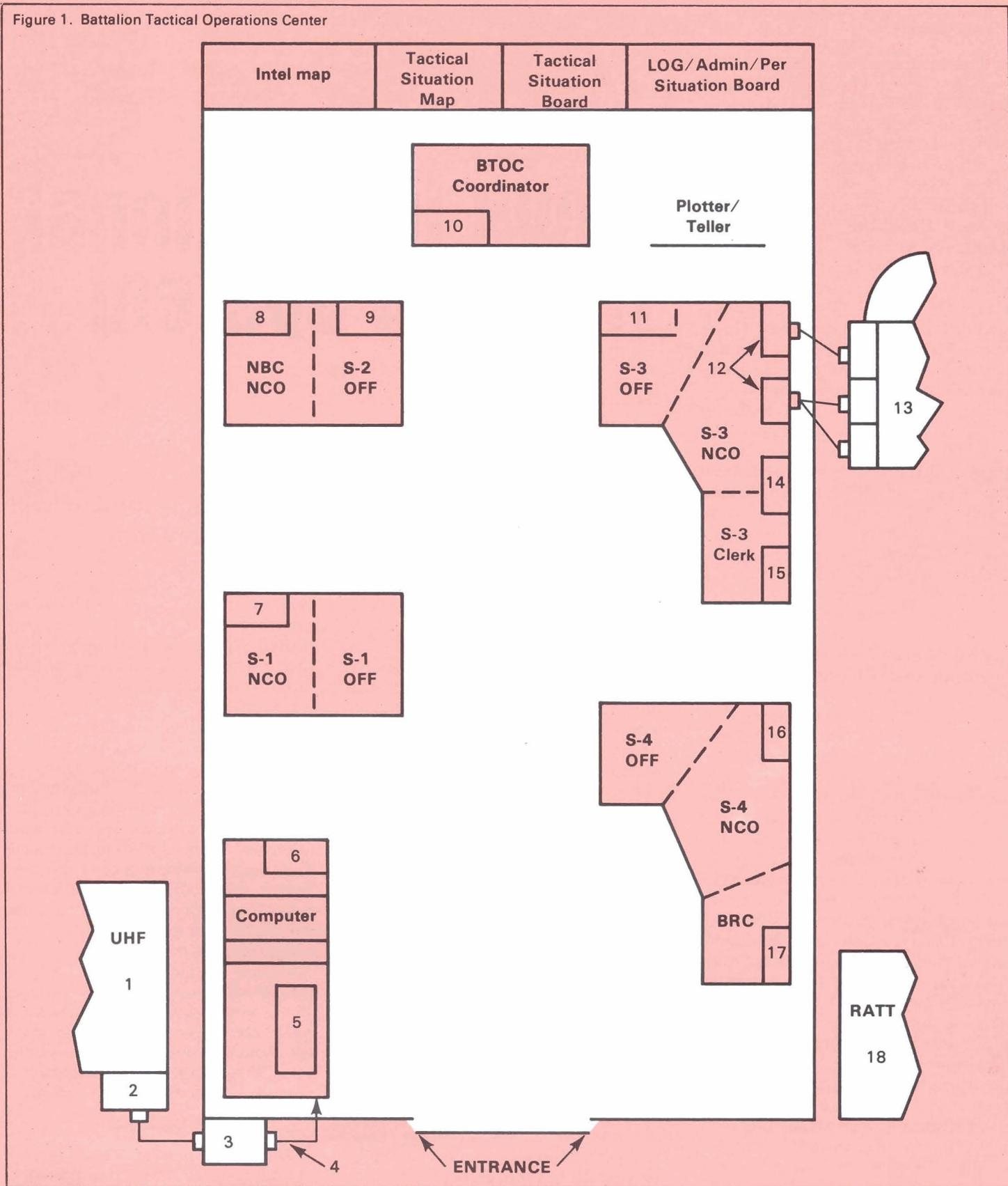
- (1) UHF multichannel van (AN/TRC-145)
- (2) 26-pair cable from UHF van to the J-1077 junction box¹
- (3) J-1077 junction box²
- (4) 26 pair cable from J-1077 junction box to users¹
- (5) SB-22 switchboard³
- (6) TA-312 for computer dedicated secure terminal^{4/5}
- (7) TA-312 for S-1 common-user switchboard terminal⁶
- (8) TA-312 for NBC common-user switchboard terminal⁶
- (9) TA-312 for S-2 common-user switchboard terminal⁶
- (10) TA-312 for commander's hot dedicated secure terminal⁷
- (11) TA-312 for S-3 common-user switchboard terminal⁶
- (12) AN/GRA-6 for remoting AM/FM radios
- (13) AM/FM radios mounted on vehicle for power and deployment
- (14) TA-312 with external speaker or AN/GRA-6 for secure dedicated message passline from higher headquarters
- (15) TA-312 with external speaker or AN/GRA-6 for secure dedicated message passline to supported units
- (16) TA-312 for S-4 common-user switchboard terminal⁶
- (17) TA-312 for BRC common-user switchboard terminal⁶
- (18) RATT rig (GRC-122)⁶

NOTES

- ¹The use of a 26-pair cable speeds setup of the BTOC and facilitates laying out wires from J-1077 to terminals.
- ²The J-1077 and 26-pair cable eliminate having to rewire the BTOC after each movement. The 26-pair cable can be rolled up at the UHF van and at the switchboard.
- ³The SB-22 switchboard allows enough channels for all required common-user lines and separates secure from non-secure lines.
- ⁴The TA-312 is operator friendly and easily maintained with the additional capability of adding remote speakers.
- ⁵Dedicated secure terminals must be attached to the J-1077 using WD-1 to ensure Tempest security requirements are met.
- ⁶Common-user lines are sufficient for those actions indicated and allow communications with all other subscribers. Long and detailed messages such as S-1 and S-4 status reports should be transmitted or received on the computer or RATT rig.
- ⁷A dedicated secure circuit should be set up from the BTOC coordinator to the battery command post for conflict resolution and command conference discussions.

In addition to the basic setup, repetitious training in communications prowords, net procedures and basic equipment maintenance will cut down on transmission time, inaccurate or incomplete messages and equipment maintenance time due to "dumb" mistakes. Every soldier must remember that the restoration of a break in communications becomes a mutual responsibility. We cannot afford to sit around without communications because "We know our stuff is straight; it's the other end that's all screwed up." If BTOC operations are to be effective, communications must be clear and continuous. Don't make the BTOC second rate by placing communications low on the priority list.

Figure 1. Battalion Tactical Operations Center



Be the Best

The Army motto, "Be All You Can Be," demands the continued pursuit of excellence and efficiency. Though current BTOC operations may be good enough to pass evaluation, are they the best they can be? Streamlining mission, battlestaff, display, and communications requirements and assets can ensure more efficient operations.

The cyclic process of evaluation, streamlining, exercising and re-evaluation may not be a panacea, but if it helps improve our ability to "win the first battle," then it is effort well spent.

Maj. Martin B. Leek is a student at the Air Command and Staff College, Maxwell Air Force Base, Ala. His next assignment will be with the J-5, Unified Space Command.

An integrated approach to Hawk institutional training will significantly improve school-based soldier proficiency, substantially reduce life cycle training cost and produce fewer on-the-job training problems for field commanders.

This is the conclusion of a recently released Hawk Project Office Study. The study recommends the introduction of computer-based instruction and simulation as the central thrust of this integrated approach. Classroom instruction and practical exercises on Hawk tactical equipment will be maintained as integral elements of total school curriculum, but with revised emphasis.

The Hawk Institutional Training System is enthusiastically endorsed by the Hawk Project Management Office, the Army Ordnance Missile and Munitions Center, the U.S. Army Air Defense Artillery School and the U.S. Army Training and Doctrine Command. The system is planned for implementation consistent with Hawk Phase III tactical hardware fielding.

The study team was chartered to evaluate the total institutional training requirement for both operator and maintenance training at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, and the U.S. Army Ordnance Missile and Munitions School, Huntsville, Ala. The study team represented an integrated effort of the combat developer, the materiel developer and the training developer operating together as a Hawk training committee. The association of the first two groups was not unusual in such an endeavor. However, the integration of the third group on the basis that the concept-based requirement methodology applies as much to the training developer as it does to the combat developer was a first, if not for the Army then certainly for Hawk.

The integrated approach has paid handsome dividends.

Although significant changes have been made to the Hawk tactical equipment since it was originally deployed in 1960, the institutional training methodology for the vital "people piece" of the system equation has remained unchanged for 25 years, relying totally on classroom lectures coupled with practical exercises on tactical equipment. While this method certainly has stood the test of time and has been effective, it has several limitations in today's Hawk institutional training environment.

This article is condensed from an article that appeared in *Army R, D&A* magazine.

Hawk Institutional Training System

A new approach to Hawk institutional training will reduce training pressure on field commanders

■ Inadequate training at the institutions is highlighted annually by field commanders as the system's major source of problems.

■ The electronic-countermeasures environment the Hawk operators will undoubtedly face in combat cannot be simulated with existing Hawk facilities. As a result, the air defense mission training for operators contains a significant void.

■ Classroom lecture is a "passive" mode of training that fails to capitalize on the quantum advance in "active" processes made possible by computer-based instruction.

■ At present, only 30 percent of organizational maintenance critical tasks and 50 percent of intermediate critical tasks are taught at the schools, while the balance is exported to the field commander.

■ The Hawk training base has always suffered from a deficit of tactical hardware. Maintenance of school tactical hardware is a constant problem due to the equipment's high usage rate and repair parts shortages. Consequently, hands-on training has been reduced far below expected levels.

■ It's doubtful that deployed Hawk units, which properly place top priority on the air defense mission, have time to complete the exported training through on-the-job training.

Systems Integration

An exhaustive analysis of the training environment and alternative solu-

tions led the training committee to conclude that the best technical approach is an integrated systems approach to Hawk institutional training that requires the presence of four interrelated components:

■ Conference. Composed of tutorial lecture instruction, group testing and administrative instruction in the classroom, this mode will account for approximately 10 percent of total instruction.

■ Computer-based Instruction (CBI). This includes tutorial, drill and practice remediation, reinforcement, second-dimensional simulation and testing delivered via a CBI system enhanced with all appropriate media. This mode will account for approximately 50 percent of total instruction.

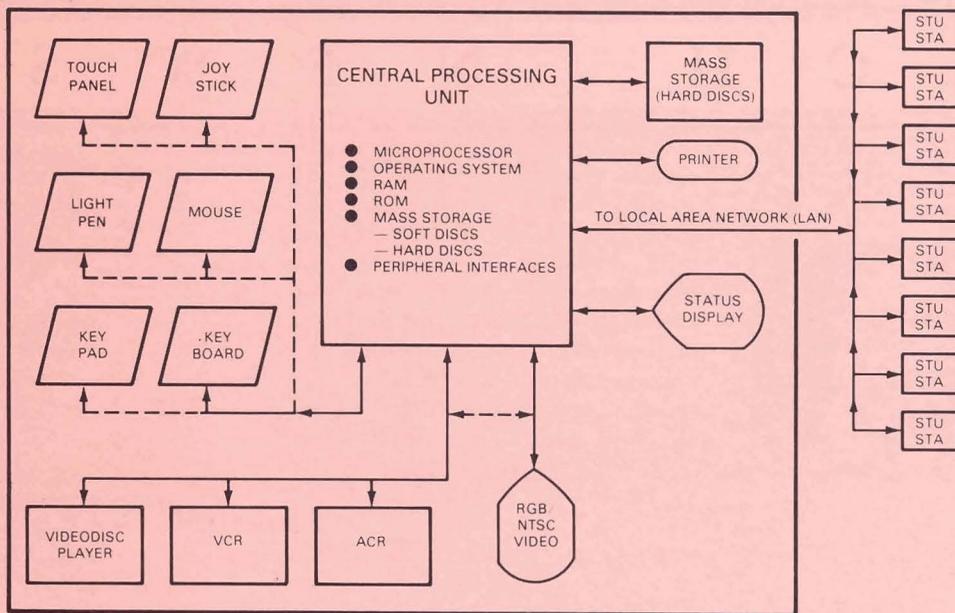
■ Computer-based Instruction Simulations. Enhanced by three-dimensional simulations of Hawk tactical hardware, this component will provide the "touchy-feelies" of actual equipment. This mode will account for approximately 15 percent of total training time.

■ Practical Exercise. This mode will account for approximately 25 percent of total training time and will involve the hands-on testing of selected Hawk tasks on tactical hardware.

HITS Major Items

The Hawk Institutional Training System (HITS) consists of CBI instructor stations, CBI student stations, four CBI simulators and the courseware.

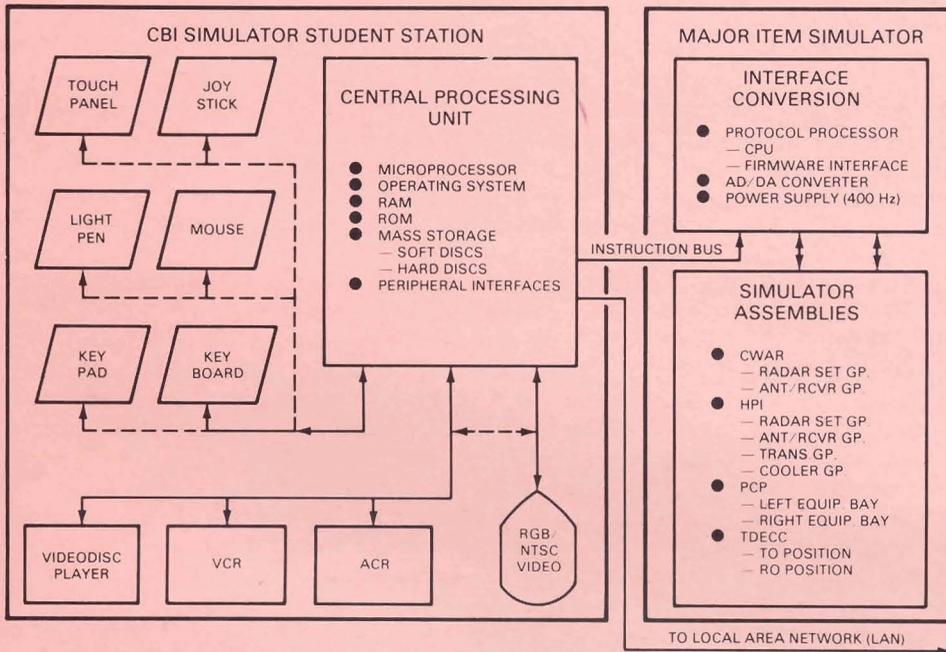
The CBI stations are full-media sys-



VCR Video Cassette Recorder
 ACR Audio Cassette Recorder
 RAM Random Access Memory

ROM Read-Only Memory
 RGB Red, Green, Blue
 NTSC National Television
 Standard Code

Figure 1. CBI Instructor Station Functional Diagram



CBI Computer-Based Instruction
 CPU Central Processing Unit
 CWAR Continuous Wave
 Acquisition Radar
 AD/DA Analog Digital/Digital Analog
 HPI High-Power Illuminator

PCP Platoon Command Post
 TDECC Tactical Display Engagement
 Control Console
 TO Tactical Officer
 RO Radar Operator

Figure 2. CBI Simulator Station Functional Diagram

tems capable of systems interactivity, performance measurement, and recording and systems management. A diagram of the CBI instructor station is shown in Figure 1. Four CBI simulators are planned: continuous wave acquisition radar, high-power illuminator, platoon command post and tactical display engagement control console. A CBI simulator student station is diagrammed in Figure 2.

The remaining Hawk major items do not require three-dimensional simulation since a combination of two-dimensional simulation and practical exercises is considered satisfactory.

Cost and Benefits

Conducting institutional training on tactical hardware is both inefficient and expensive. With HITS implementation, tactical equipment requirements will be dramatically reduced at both the Air Defense Artillery School and Ordnance Missile and Munitions Center. The HITS approach is expected to save the Army \$58 million over a 10-year period.

In addition, HITS will result in a dramatic increase in the number of tasks that can be taught in each Hawk MOS and will prove to be a teaching capability that cannot be achieved even on tactical hardware. The results will be a better trained and more competent soldier emerging from institutional training.

While not tabulated in the cost benefits analysis, downstream benefits should appear in the field in terms of improved mean-time-to-repair, decreased repair parts requirements and overall improved systems readiness. The bottom line is that HITS will eliminate the weakest link in the Hawk system — inadequate institutional training.

Bennie H. Pinckley is the chief engineer in the Hawk Project Office, U.S. Army Missile Command, Huntsville, Ala.

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The authors wish to acknowledge the following individuals for the analysis that formed the technical basis for the preceding article: Gene Stapher and Jim Hendly, Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School; SFC Steve Pleva, U.S. Army Ordnance Missile and Munitions Center and School; and Bill Morgan, Jim Ross and Jim Berry, Raytheon Co.

ADA Assignments MILPERCEN

*Lt. Col.(P) James L. Frederick
Chief, Air Defense
Artillery Branch*



Promotion List Released

Since the last issue, two promotion lists have been released and our air defenders did very well on both. Let me extend congratulations to all those who were selected for promotion to major and colonel.

The focus of my column is on the senior rater profile restart. The senior rater profile is one of the major features of the current OER system. The profile allows the senior rater to control the basis for selection board interpretation of the value of the box check. Easy raters are not given an advantage over hard raters. In fact, if anything, the opposite may be the case.

Two important points must be emphasized. First, the key to the continued success of the system depends upon senior raters accepting the fact their profiles send a message. If the message is not what he or she desires to send, the profile should be restarted. Second, there is a normal tendency to be positive, to give the benefit of the doubt, to be proud of our organization and to be responsible for our subordinates. These norms are often reflected in rating philosophies. Simply stated, some rating inflation is a way of life, and, when under control, it is not quite the evil that it is sometimes thought to be.

Nevertheless, for our evaluation systems to continue to pick the best for our future leadership, there needs to be a self-regenerating mechanism to deal with the rating inflation and avoid the significant trauma associated with frequent and dramatic systems changes. The system is the profile restart. *Caution — shifting senior rater philosophies without a DA accomplished restart is a dangerous business.* The senior rater runs the risk of sending the wrong message concerning those he or she evaluates subsequent to the shift.

Senior raters may discuss their profiles and or restart their profiles by contacting the Evaluation Systems Office (DAPC-MSE), at AV 221-9659/9570 or commercial (202) 325-9659/9570.

Restarts are normally done on the first day of the month nearest to the date the senior rater telephonically contacts or personally visits DA. It should be noted that senior raters have the option to restart all grades across the board or, if desired, only selected grades. Important to note, no profile will ever be restarted without the personal knowledge of the senior rater concerned.

Currently, the senior rater profile restart is only available to senior raters for their profiles maintained by MILPERCEN (evaluations on active duty officers). The U.S. Army Reserve and National Guard do not have the restart capabilities for

profiles of senior raters who have evaluated officers managed by the U.S. Army Reserve Personnel Center, St. Louis, Mo., or the National Guard Bureau, Falls Church, Va.

As a side note, in an attempt to improve the appearance of the Air Defense Artillery area here at MILPERCEN, we are seeking air defense action photos, oversized crests, plaques or models that you may have and are willing to share. If you can help, please send the items to us and we will ensure your unit receives credit. Send items to: HQ MILPERCEN, ATTN: DAPC-OPE-A, 200 Stovall St., Alexandria, VA 22332-0400.

From the Lieutenant Colonels Desk

Maj.(P) Roger A. Wright



Significant Statistics

Perhaps I could describe the last quarter as a fairly slow period in the personnel business, but that might present the impression that nothing is going on — quite the contrary. This column does not zero in on anything specific but is a compilation of several issues.

★ I will say here and again at the end — send in updated preference statements, phone numbers and mailing addresses.

★ A myth that I once believed is that if you call “branch,” you will soon be reassigned — not true.

★ Ninety percent of all assignments are made from a date of availability roster that is no more than an alphabetically listed roster identifying who is available to move next, based on DEROS or a standard three years stateside tour completion.

Three-year tours are normal; however, due to personnel shortages in critical functional areas (49, 51, 53) and other short-fuse requirements, tours may and do run less. Two-year assignments are not uncommon.

The lieutenant colonel command board is still scheduled to convene Dec. 2, 1986, and, as it stands right now, Air Defense Artillery will have 25 commands (an increase of one from last year) primarily in Germany. If I can count correctly, there will be five Patriot, five Hawk, 12 Chaparral/Vulcan and three other battalion openings for FY 1988.

Update your photo, officer record briefs and review your microfiche. If you question the quality of your file photo, call me. Do not let uncertainty ruin your chances for command.

If you are fortunate enough to be selected for command, slating will be based on regimental affiliation, branch experience, current assignment location (CONUS, Korea, Europe), standing on order of merit list and individual preferences. Because individual desires do come into play, get your preferences to me prior to the board's convening date.

The recently released colonel's list had 26 ADA officers — 23 from the primary zone and three from below the zone. This was a significant increase from last year and above the Army

average. Of the 26 selected, 22 were former or serving battalion commanders and the four others possessed functional area 46 (public affairs), 49 (operations research/systems analysis) and 53 (automated data systems management). For those of you who may not have seen the statistics, ADA selection rate for primary zone was 60.5 percent compared to the Army average of 51.3 percent. The below the zone for ADA was 2.2 percent compared to an Army average of 1.5 percent.

A small but significant statistic — of 100 officers in a particular year group coming on active duty, approximately 11 will make battalion command and three may eventually make brigade command. Twenty-six will make colonel and 15 will go to a resident senior service college.

I must also touch on OERs. The senior rater profile, along with the senior rater narrative, continues to be the most important part of the OER. Another factor is the performance and potential blocks on the back of the OER. Boards do not have a lot of time to read words, so what is written has to be well written. It should be concise and to the point. To fill up the narrative blocks from top to bottom and side to side could

be a waste of time and effort. Key sentences are the first and last. Call me anytime for file evaluation. I have talked to many officers who are totally unaware of how their files compare to their peers.

As I have said before, I am here to help you with your assignments and professional development. I would like to say again — the needs of the Army and Air Defense Artillery come first! This fact sometimes gets put in the back of officers' minds and personal preferences move to the front. Just bear in mind that I will do what I can to help, but assignment officers are also bound by regulations, operating instructions and other guidance that often tie our hands as to what we can and cannot do. MILPERCEN does not make the policies; MILPERCEN implements. DA staff makes the policies.

If you come in for an interview, call ahead of time. Send in updated photos, preference statements, phone numbers and mailing addresses. We are located in Hoffman II, Room 4N65. Our numbers are AV 221-0025/0026 or commercial (202) 325-0025/0026.

From the Majors Desk

Capt.(P) John S. Westwood



Each day at MILPERCEN I have the opportunity to talk to officers from all over the world. Questions range from professional development to special interests. Additionally, many questions pertain to the personnel actions arena. Since Army boards are such an important part of personnel actions, I thought it would be worthwhile if I directed this article to helping us better understand some of the more important boards. **Although these boards may not affect us personally, understanding them will help us better advise and counsel our soldiers.**

Army Boards

Board	Proponent	Regulation	Frequency	Function
DA Suitability & Evaluation Board	DCSPER	AR 600-37	On-going	<ul style="list-style-type: none"> ■ Removes or adds adverse information to the performance fiche (P-fiche). ■ Moves Article 15s from the P-fiche to the restricted fiche (R-fiche). ■ Moves letters of reprimand from the P-fiche to the R-fiche. ■ Resolves security revocation cases.
Office of the Deputy Chief of Staff for Personnel Special Review Board	MILPERCEN	AR 623-105 Chapter 9	On-going	<ul style="list-style-type: none"> ■ Reviews OER/AER appeals. ■ Determines eligibility for Special Selection Board.
Army Board of Correction of Military Records	OSA	AR 15-185	On case basis	<ul style="list-style-type: none"> ■ Processes application for correction of records and injustices. ■ Acts as the final appeal authority after all other resources have been exhausted. ■ Considers all applications before it, for the purpose of determining the existence of an error or injustice.
DA Active Duty Board	MILPERCEN	AR 635-100 Chapter 3	Monthly	<ul style="list-style-type: none"> ■ Makes recommendations on the following issues: <ul style="list-style-type: none"> Substandard performance Misconduct Derogatory information OTRA officers ■ Only the secretary of the Army has removal authority.

B R A N C H * N E W S

Board	Proponent	Regulation	Frequency	Function
DA Elimination Board	MILPERCEN	AR 635-100 Chapter 5	Monthly	<ul style="list-style-type: none"> ■ Recommends removal from active duty due to: <ul style="list-style-type: none"> Substandard performance Misconduct Derogatory information ■ Has authority to retain officers.
Officer Personnel Management Directorate Special Review Board (OPMD SRB)	MILPERCEN	OPMD OI 135-215-2	Weekly	<ul style="list-style-type: none"> ■ Acts on case involving: <ul style="list-style-type: none"> Removal from active duty. Compassionate reassignments. Waiver of active duty service obligation for resignations or requests for release from active duty. Retention beyond established mandatory release date.
Project Manager Development Program Board	MILPERCEN	DA PAM 600-3	Quarterly	Approves additional skill identifier (ASI) 6T (project manager designator).
In-service Flight Application	MILPERCEN	AR 611-110	3 times a year	Approves officers applying for attendance to flight school who have completed their initial assignment.

Certainly there are additional boards that play an important part in our careers. I believe the boards listed are the ones we most often have a need to understand. No officer can possibly learn all the intricacies of the personnel system.

What we want to be successful in doing is knowing where to go for the right answer. If we can achieve that, the battle is half won. The purpose of this article is to help us toward that end.

From the Captains Desk

Capt.(P) Leslie P. Pettet



Send Them to the Experts

You do not have to be an expert to help someone — you only have to understand that a program exists. Get that person to an expert — normally your personnel actions section at the local military personnel office. Some important programs to know about:

★ **Exceptional Family Member Program:** An automated system designed to match potential duty locations with a family member's educational or medical need. It involves going to a local medical facility and filling out forms, a medical checkup, and being honest in your needs. For more information consult AR 614-203.

★ **Compassionate Reassignment:** Designed to move a soldier to a location where he may assist relatives with financial or medical problems. Justification is that your presence is needed, for a year, to help the relative get out of or get past an extremely difficult time. Other siblings must not be available or able to provide what you can. Approvals are much more frequent than you might think. For more information consult AR 614-101.

★ **Army Married Couples Program:** An automated system

designed to alert assignment officers to perform a joint domicile PCS. Key is the officer record brief on which one indicates, "married to service member." Consideration for joint assignments, within the needs of the Army, is given for all marriages of all rank combinations.

★ **Relook/Standby Advisory Board.** These special boards convene to promote or not promote officers not seen by their proper promotion board. This usually occurs because your date of rank was wrong and, therefore, you were not on the eligibility list; a mandatory OER was not seen by the original board; your MEL/CEL was incorrect on your ORB (by no fault of your own); an award of Silver Star was not on your ORB; and some other special cases. These boards are duly constituted DA secretariat boards; for example, the lieutenant colonel promotion board reconvenes as a STAB after it finishes its lieutenant colonel business. For more information consult AR 601-100.

★ **Officer Candidate School** offers an extremely competitive process to become a commissioned officer. It involves a resume, interviews, and both local- and DA-level selection boards. Once selected, about 20 percent get cut from the program the first few weeks of OCS mainly because of the physical demands. See AR 135-1.

Potpourri

★ The FY 1987 majors selection board convenes March 3, 1987 (if it is not slipped to later in the year). Year Group 77 is in the primary zone. Get your officer record brief and photo updated.

★ **Preference Statements.** If you would rather not use the high-tech marksense form, just write a note or use the old

form. Whatever, keep your home and duty phone numbers up-to-date.

★ Year Group 80 functional area designation is being done now. If you are in this year group and have not been contacted to send in a special preference statement, call me soon.

★ To get a copy of your official microfiche, send your name, address and social security number to HQ MILPERCEN, ATTN: DAPC-MSR-S, 200 Stovall St., Alexandria, VA 22332-0400. Sign the letter and do not send money. It takes about four weeks.

★ The ADA Advanced Courses are now conducted only four times a year, in October, January, March and June. This means that officers with DEROSs between classes can expect to be curtailed or extended overseas depending on the DEROS.

★ OERs. Make sure Part IIIa (duty title) spells out what you are. It should be understandable to a signalman, an MP, etc. Other than just air defenders look at your OERs. Using "ABMOC" or "TCO" or "ADV BAT ADA" or "DAME" only confuses readers. The importance of the job is lost since the board member does not have the time to read nine lines of the duty description. So be as clear as you can in the duty title.

★ There is important new information on the Competitive Voluntary Indefinite Program. Beginning with the December

1986 captain promotion board, the selection rate for captain should remain about the same. But, and this is a big but, the selection rate for CVI is projected to decrease to about 70 to 75 percent. This means that an officer may be selected to captain but not for CVI. A significant change is that if an officer does not submit his CVI application on time (when eligible for the captain board), and if he would require a short-term extension to active duty to get him beyond the board results, his application will not be accepted. Example: a USAR officer comes into the Army in June 1984 with a three-year active duty service agreement (plus any extension to get her a full three-year overseas tour). Her ECUR/ETS is June 1987. She does not apply for CVI for her December 1986 Captain/CVI board. Her battalion commander, battery commander and fellow officers convince her to go ahead and "stay on" for a few more years. She gets excited about the idea. She applies in January 1987 for CVI for the July Captain/CVI board and the application is returned without action. She will have to separate in June 1987. Had she applied for her regular captain board, she would have had time to deny CVI before her ECUR/ETS arrived. The point is that USAR officers will have to submit their application on time.

Keep in touch.

From the Lieutenants Desk

Capt. Robert Woods



Frequent Questions Answered

The questions most frequently asked, in addition to assignment instructions, concern the availability of additional schooling after the officer basic course, TRADOC assignments and overseas duty. In this issue I will focus on additional schooling.

Air Defense Artillery lieutenants are undoubtedly some of the most highly motivated individuals in today's Army. The basis for this statement is the numerous requests by the lieutenants to attend additional military schooling. Over 75 percent of each OBC class requests additional opportunities to "be all that they can be." The most frequently requested schools are airborne, air assault, ranger and the Junior Officer Maintenance Course. Additional schools include the Advanced Physical Security Course; Defense Language Institute; Nuclear Biological and Chemical Defense Officer; and the Pathfinder Course.

Several factors influence the availability of slots for each of these schools. These factors include the number of lieutenants in your OBC class who have requested the same school, the number of slots available to the Air Defense Artillery branch, the compatibility of the lieutenants' graduation

dates, the required report dates to the PCS assignments and the dates of the requested schools. For example, if 20 lieutenants all desire to attend airborne school and the Junior Officer Maintenance Course, but the ADA branch only has 10 slots for each class, then it is impossible for all 20 lieutenants to have both schools.

I will work with the MILPERCEN Education Branch to ensure that the greatest number of lieutenants can attend at least one of their requested schools. It is vitally important that you prioritize your choices. This prioritization provides me with better information from which to satisfy your requests.

Students routinely ask if it is permissible to attend more than one school after OBC. If there is no conflict between the reporting dates at the two schools, the answer is an unequivocal yes. The only exception to subsequent schooling is when the lieutenant has a mandatory report date to his new unit. However, the vast majority of report dates are adjusted by a few weeks to allow for the additional schooling.

The following chart (see next page) is a valuable tool which lists the primary characteristics of the most frequently requested schools.

School	Length	Max No. of Students	Number of Classes
Airborne	3 Weeks	540	48 per year
Air Assault	2 Weeks	Controlled by Fort Campbell — not DA	40 per year
Ranger	8 weeks, 2 Days	175	14 per year
JOMC	6 Weeks	36	20 per year
Adv Phy Sec	2 Weeks	50	6 per year
D.L.I.	Language Dependent		
NBC Defense	1 Week, 2 Days	30	12 per year
Pathfinder	3 Weeks	48	14 per year

Note 1: The maximum number of students shown is for the entire U.S. Army, not just the Air Defense Artillery Branch.

Note 2: Allocations to Ranger/Pathfinder slots have been drastically reduced. All allocations to these schools are now filled based upon a specific job requirement.

In the next issue I will focus on TRADOC assignments, and other important topics. If you have any specific topics that you would like for me to discuss, please call me at AV 221-0025/0026. Thought for the quarter: Don't tell your boss how hard you've worked. Rather, tell your boss how much you've gotten done.

Enlisted Personnel Management

Capt. Howard Bromberg



Assigning Married Army couples

"Why is my spouse being assigned to Post X and I'm not being assigned there?" This is a common question asked by many newly married Army couples. However, if individual soldiers and their chain of command understand how the Married Army Couples Program works it will help the Military Personnel Center in assigning married Army couples.

Last year the Joint Domicile Program and the Married Army Couples Program were merged into a single Married Army Couples Program. Since October 1, 1985, all soldiers married to another soldier must be enrolled in the program to be considered for joint worldwide assignments. Over 36,000 soldiers have enrolled. Here are some answers to common questions.

How are soldiers enrolled?

Enrollment begins with verification that two soldiers are married to one another. This information is then placed in the Enlisted Master File by means of a SIDPERS transaction

through the couple's servicing MILPO. This transaction will place each soldier's service number and component of service in their spouse's master file.

How is the assignment made?

When either soldier is nominated for an assignment, both soldiers are automatically *considered* for a joint assignment. If the assignment is overseas, MILPERCEN contacts the appropriate overseas command to obtain pinpoint assignments — but only if valid requirements for both soldiers exist at the gaining location.

Both soldiers receive their pinpoint assignments, or a special message is added on the assignment instructions stating that a married Army couples assignment was considered but could not be accommodated.

What is the basic eligibility criteria?

- ★ The request must be based on a valid marriage. An intended marriage will not be considered.

- ★ A valid requirement must exist at the desired location.

- ★ A second PCS within the same fiscal year will normally not be approved.

- ★ Any PCS constraints in effect apply equally to the program.

- ★ A soldier must have completed 12 months at his or her current duty station and be able to complete the new tour requirement upon PCS.

- ★ A soldier in advanced individual training must apply prior to completion of AIT.

What can a soldier do to help the program work?

- ★ Ensure he or she is properly enrolled in the Married Army Couples Program by checking with the local military personnel office.

- ★ Ideally, possess MOSs in related career fields (For example 24C and 16E.)

- ★ Do joint career planning such as re-enlistment that supports joint assignments.

The Army requirements and readiness goals are first priority when considering personnel for assignment. However, the Military Personnel Center will exhaust every possible alternative when considering a couple for an assignment.

If you have any questions, your battalion S-1 or servicing military personnel office can provide further assistance.

Some Senior ADA NCO Positions Downgraded

Three ADA sergeant major TDA positions and 15 ADA master sergeant TDA positions were reduced by one grade during the recent action to resolve the Armywide overstructure problem for FY 1988. No ADA top NCO TOE positions were changed in the downgrade.

The Soldier Support Center said a downgrading of sergeant major and master sergeant positions is needed so manning documents match the budget authorization for sergeant major and master sergeant. There is a congressional cap of three percent on senior grades, E8 and E9.

In deciding which positions to downgrade, Soldier Support Center used the following standardized criteria:

- ★ Senior NCO s should not work for another NCO of equal grade, particularly within the same organizational element.

B R A N C H * N E W S

It is recognized that in some instances companies will contain more than one E8, for example a first sergeant and master sergeant.

★ Excessive clustering of supervisory capability should be avoided within the same organizational element. Where high levels of technical proficiency are required, staff sergeants and sergeants first class should be viewed as optimal since, in nearly all specialties, E8s and E9s become more supervisory and management oriented.

★ Every effort should be made to standardize grading of similar positions in like organizational elements. For example, although there is considerable similarity in administrative NCO duties associated with many positions, the grade levels range from sergeant to master sergeant.

★ Where warrant officer and enlisted positions within the same occupational discipline are authorized in the same organizational element, the highest enlisted grade should be no more than sergeant first class.

★ Use of NCOs in senior supervisory positions should be avoided where an appropriately graded civilian supervisor is authorized in the same organizational element.

Reserve Air Defense Artillery Branch

The Air Defense Artillery Branch of Officer Personnel Management Directorate at the Army Reserve Personnel Center, St. Louis, Mo., provides personnel management support to ADA officers of Troop Program Units (TPUs), Individual Mobilization Augmentees (IMAs), and members of the Individual Ready Reserve (IRRs).

Primary responsibilities of the branch are planning, coordination, assignment and training of ADA officers not on active duty. Professional development of those officers is handled by the personnel management officers (PMOs) assigned to this office. They:

★ Monitor all Reserve ADA officers throughout their careers.

★ Act as points of contact for assistance and information.

★ Coordinate readiness training tours and other training opportunities for qualified officers assigned to the IRR.

★ Counsel and coordinate professional development schooling for all Reserve ADA officers.

★ Provide information on available assignment opportunities for TPUs based in the continental United States.

★ Provide Reserve officers to other Army agencies for tours of temporary duty such as annual training site support, exercises and schools.

Currently, the Air Defense Branch manages 1,100 IRRs and IMAs, and 546 TPU officers. All Air Defense Artillery officers assigned to the U.S. Army Reserve should contact their PMO a minimum of twice a year. This assists in updating records, keeping a current address and telephone number on file, and providing a conduit for information concerning professional development as well as status for participation with readiness training tours designed to keep needed ADA skills sharp.

To contact this office, write to: Commander, ARPERCEN, ATTN: DARP-OPC-AD, 9700 Page Blvd., St. Louis, MO, 63132-5200, or call: AV 693-7872, or toll free 1-800-325-4895. Within Missouri, officers should call collect 314-263-7872.



Lt. Col. Jerry G. Rhyne
ADA Branch Chief
(lieutenant colonels and majors)



Maj. Meredith H. Fox
(captains)



Capt. Gary S. Calabrese
(lieutenants and ground liaison officers)



Ms. Kathleen Hughes
(all grades)

Office of the ADA Proponent

U.S. Army Air Defense
Artillery School

CWO 2 Jim N. Cupp



Technology Dictates Need for Warrants

The increasing technological complexity of the modern Army dictates a need for a corps of officer-level technicians. They are needed to fill those positions in which a high degree of specialization is required. This requirement establishes a definite and continuing need for the Army warrant officer.

Warrant officers are appointed to meet air defense requirements for officers who are highly specialized in specific technical career fields. The Department of the Army projects the active-duty procurement requirement for each warrant officer military occupational specialty (MOS) and annually announces those MOSs that are open for applications. Air defense MOSs currently open for procurement are listed below.

MOS	From	To
221B Nike Missile Assy Tech	Aug. 1, 1986	Sept. 30, 1987
222C Patriot Sys Tech	Oct. 1, 1986	Sept. 30, 1987
223B Hawk Sys Tech	Oct. 1, 1986	Sept. 30, 1987
224B Chaparral/Vulcan	Oct. 1, 1986	Sept. 30, 1987
225B Command and Control	Aug. 1, 1986	Sept. 30, 1987

Prerequisites for appointment can be found in DA Circular 601-85-4. All eligible soldiers who desire to compete for appointment are invited to apply. Each applicant is evaluated by a DA warrant officer selection board. Anyone selected is scheduled for the Warrant Officer Entry Course and the appropriate warrant officer technical certification course. The direct appointment program was curtailed in FY 1985.

Recently, Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, expressed his concern that the accession goals for air defense must continue to be met. Air defense commanders have been encouraged to actively promote the warrant officer program and encourage all qualified personnel to apply.

The role of the air defense warrant officer is vital to the mission. Our warrants are accessed from the ranks of highly qualified NCOs and assigned responsibilities commensurate with their abilities. They serve in all levels of command and their advice is considered invaluable. In many instances their presence has made the difference between success and failure. If you desire to identify with such people, and are concerned about your branch, then consider submitting an application. There will always be a need for warrant officers.

Warrant Officer Commissioning

A change to Title 10, United States Code (USC), now permits the commissioning of warrant officers.

Commissioned warrant officers —

- ★ have the authority to administer oaths for re-enlistment.
- ★ may be designated in command as commanding officers.
- ★ service will be characterized as commissioned officers.

For example, commissioned warrant officers in a command have the status of commanding officer, giving them greater authority to impose nonjudicial punishment under Article 15, Uniform Code of Military Justice (UCMJ).

There are additional interpretations of the new law for commissioned warrant officers:

- ★ They may order enlisted soldiers into arrest or confinement by their own authority under Article 9. A warrant officer who is not commissioned must first receive permission from a commanding officer.

- ★ They are subject to Article 133, UCMJ, conduct unbecoming an officer and a gentleman.

- ★ They may sit on courts of inquiry appointed under Article 135, UCMJ. Warrant officers who are not commissioned may not.

- ★ They are eligible for inter-service transfers under Title 10, USC, Section 716.

- ★ They are not statutorily precluded from appointment as summary court-martial officers. However, under the Manual for Courts-Martial, a summary court-martial should hold the rank of captain or higher.

The change to Title 10, USC, is already in effect and is designed to standardize procedures and policies among the Armed Forces for the appointment of warrant officers.

The commissioning process has changed. The president will commission Regular Army (RA) warrant officers upon promotion to RA chief warrant. Promotions under the temporary Army of the United States system have no effect on commissioning.

An other than RA warrant officer, when promoted to a permanent chief warrant officer grade, will be commissioned by the secretary of the Army.

The commissioning of warrant officers currently does not affect retirement eligibility. Warrant officers with at least 20 years of active federal service may still retire under the provisions of Title 10, USC, Section 1293.

Officers with more than 20 years of service that includes at least 10 years of service as commissioned officers or commissioned warrant officers may retire under Title 10, USC, Section 3911.

Study will continue on the impact of this change. All regulations will be screened to identify areas that may be affected by warrant officer commissioning.

SCANNING

Army Tests IFF/EW System

The challenge to today's air defender is difficult. The gunner must acquire the target, positively identify it and engage it. For the forward area air defender, these tasks must be done visually within a few seconds. Any compromise of visibility is a direct liability to the mission of Air Defense Artillery in the forward area.

These factors prompted the Army to consider an air defense electronic warfare system (ADEWS). A combination of the Navy's AN/SLQ-32 and the Air Force's AN/ALQ-128, the system is primarily a passive sensor which receives radio signals emitted by aircraft avionics. The signals are compared against a computerized library, and an exact aircraft identification is displayed. The system produces no radio frequency emissions in the electronic support measure mode.

The other half of ADEWS is the electronic countermeasure system which receives the signal, identifies it as a threat and transmits an amplified signal along the same azimuth. ADEWS can jam several emitters simultaneously and can be turned off by the operator to enhance survivability.

The system's passive capability and long range make it almost invulnerable to anti-radiation missiles.

Contained within an S-280 shelter on a five-ton, long-bed truck, the system underwent several modifications to comply with safety regulations. Once a safety release was issued, a team of NCOs from White Sands Missile Range, N.M., began training on the ADEWS last July. These soldiers became the primary operators of ADEWS during concept demonstration testing that began Aug. 30 and will end Oct. 30 at Eglin Air Force Base, Fla.

The results of the test may determine whether or not the Army fields ADEWS. Success of this system could provide the air defender with the early warning and positive identification he needs to effectively engage enemy aircraft. (2nd Lt. Charles D. Bales, *Missile Ranger*)

Vulcan, Chaparral Safety Profile

The following are four factors that have caused accidents.

Inadequate overhead clearance: The self-propelled Vulcan and Chaparral systems are mounted on top of the M-113 chassis; specifically, the M-741 chassis on the Vulcan and the M-730 chassis on the Chaparral. When moving in a tactical environment, these systems are highly vulnerable to trees with low branches. This situation has resulted in extensive damage to weapons.

Countermeasure: Operate carriers at low speed in tactical areas, especially during low-light or blackout conditions. Ensure weapons have sufficient overhead clearance from tree limbs at all times when carrier is in operation.

No ground guides: Failure to use ground guides is a recurring problem. Personnel have been injured and weapon systems and carriers damaged in both motor park areas and tactical training areas because of no ground guides to ensure adequate clearance.

Countermeasure: Enforce the use of ground guides as required by FM 21-17, December 1981, Page 15; FM 21-306, April 1983, Pages 19-20; and FORSCOM Commander message 162100Z March 1984, subject: FORSCOM Vehicle Ground Guiding Policy.

Improperly mounted personnel: Personnel standing in the M-561 gamma goat while performing as air guards have been injured because of falling and being run over by the towed Vulcan.

Countermeasure: Ensure personnel used as air guards are seated or supported, not standing, during vehicle operation. Ensure gamma goat operators maintain a slow speed and negotiate road obstacles with care.

Jackknifing: Findings in past accidents have shown that the M-561 gamma goat and towed Vulcan are susceptible to jackknifing in ice and snow conditions. They are further susceptible to swerving while negotiating downhill curves.

Countermeasure: Operate the gamma goat in lower-gear ranges at slow speeds in ice or snow conditions and on downhill terrain, thereby using the transmission to reduce speed. Use brakes with extreme caution since they may lock and cause a jackknife. (SSgt. E. Odom, *Countermeasure*)

TRADOC Approves Improved ARTEP Concept

The revised TRADOC Regulation 310-2, Design, Development and Management of ARTEP Documents (Mission Training Plans [MTPs] and Drill Books), has been approved. See "Scanning" in the Summer 1985 issue of *Air Defense Artillery* for a detailed explanation of MTPs.

The MTPs are formatted in six chapters. Chapter 1 gives a foundation for the other chapters and explains their use. Chapter 2 contains matrixes and lists which show the relationships among missions, exercises, tasks and references. Chapter 3 graphically portrays the relationship between critical wartime missions and subordinate tasks inherent to those missions. Chapter 4 details exercise scenarios with all preliminary training requirements to give a preconstructed, flexible vehicle for training and sustaining the proficiency of key missions. Chapter 5 gives the conditions, standards, subtasks and subtask standards for each collective task for the identified unit. Chapter 6 contains instructions for developing and conducting an external evaluation.

Battle drills will be published in "drill books." Each drill



Air defense electronic warfare system (ADEWS)

book contains those drills applicable to identified crews, sections or platoons. They directly support MTPs and are used as subtasks and standards in MTPs.

Coordinating drafts of each MTP and drill book will be forwarded to all user units for review and comment. Your expertise in the form of constructive comments is needed to produce the best training publications for you.

For more information, contact Jim Kelley at AV 978-3450, FTS 915-568-3450, or ADA 24-hour hotline AV 978-3159. The address is Commandant, HQ USAADASCH, ATTN: ATSA-DTU-SA (Mr. Jim Kelley), Fort Bliss, TX 79916-7090.

Chaparral Testing Continues

Although the Chaparral air defense system has been in the Army's inventory since 1970, testing for improvements continues.

Today's Chaparral testing consists of a rosette scan seeker and an asbestos-free, smokeless rocket motor.

The rosette scan seeker will provide the system with an infrared counter-countermeasure capability and will increase the missile and target acquisition range. Contractor testing was successfully completed in February 1986. Government tests began in April and consist of a complete environmental assessment as well as the firing of 24 missiles against a variety of targets, launch conditions and countermeasure scenarios. These tests are expected to continue through December 1986.

The asbestos-free, smokeless rocket motor is intended to eliminate the asbestos from the motor liner without decreasing performance or increasing safety hazards. Three vendors are in competition. Eighteen motors from each vendor are undergoing safety qualifications in climatic and dynamic environments. Performance data is being obtained from static firings at extreme hot and extreme cold temperatures. Safety is being addressed throughout the program. Once the vendors are certified, they will compete for production contracts. Testing began in October 1985 and will continue through October 1986.

Future Chaparral activities include:

- * A foreign missile sales version is projected for testing in 1987 and 1988. This will consist of an environmental and firing program, and an environmental test of an M-48A2 launcher. Two configurations of missiles will be tested on separate schedules. Testing is projected to start in July 1987 and continue through September 1988.

- * First article and initial production testing of the rosette scan seeker guidance section will begin in conjunction with the production program and is anticipated to continue through 1993.

- * Initial production and safety qualification tests of the winner of the asbestos-free smokeless rocket motor contract is anticipated for January through October 1988.

Chaparral continues to be an active program. Initiated as an interim stopgap measure in 1965, Chaparral's future looks extremely bright. (John T. Sweem, ARMTE, White Sands Missile Range, N.M.)

System Flies Six Drones Simultaneously

An improved drone formation control system (DFCS) at White Sands Missile Range, N.M., recently flew six jet fighters through a test mission. The previous record was four

drones at a time. The new capability is important to Air Defense Artillery because the system can be used to test ADA weapons, such as Patriot, that can engage more than four targets simultaneously.

During the six-drone test flight, the new DFCS computer accomplished automatic takeoff from Holloman Air Force Base, N.M.; rendezvoused the drones over the northern part of the missile range; and assembled the drones into two formations of three aircraft each. The computer then "closed up" the two formations into coupled sets of three aircraft and flew the drones on a southbound flight pattern to simulate a realistic attack force. The computer then spread the formation and systematically peeled off the drones for a computer-controlled landing sequence at Holloman, 38 miles away from the missile range.

The new DFCS computer now gives White Sands the capability to provide the Department of Defense with realistic test scenarios for air defense weapons testing.

Hawk Celebrates 30th Birthday

Hawk, the free world's unblinking sentinel, celebrated its 30th anniversary without fanfare. On its June birthday, Hawk was in position around the United States and a score of friendly nations doing the job it does best — guarding the skies against low- to medium-altitude air attack.

As the Army's oldest operational missile, Hawk has maintained its longevity by keeping pace with evolving technology. And the end of its useful life is nowhere in sight.

For Hawk to be alive and thriving after three decades is a tribute to the men and women, soldiers and civilians of both the Army and the industry Hawk team. Good people and a good system means Hawk could easily be around for another 30 years.

Hawk was born on a hot, sunny June 22, 1956, at White Sands Missile Range, N.M.

There was only one missile, no backup. The single rail launcher was affectionately dubbed "leaking Lena" because of hydraulic leaks. Damp cloths were placed over the missile guidance section during preflight tests to prevent overheating.

But when the button was pushed at about 1 p.m. the missile swooped down on the F-80 drone flying at 11,000 feet and demolished it in a shower of flaming fragments. That's a scene that has been repeated many times since then. Happy birthday, Hawk. (Bob Hubbard, *Redstone Rocket*)

FAADS Platoon Leader's Guide

The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has recently published a pocket-size, ready-reference guide for forward area air defense system (FAADS) platoon leaders. The FAADS Platoon Leader's Guide contains frequently used information platoon leaders need to fight the air-land battle in the combined-arms arena. The handbook is designed for use in conjunction with unit tactical standing operating procedures in training exercises.

The handbook was distributed to ADA units in July. Copies may be obtained by writing to U.S. Army Air Defense Artillery School, ATTN: ATSA-EVD, Fort Bliss, TX, 79916-7040, or by calling Capt. Paul J. Preddy of the school's Directorate of Evaluation and Standardization at AV 978-3895/5721.

Visual Aircraft Recognition Update

Field Manual 44-30, Visual Aircraft Recognition, October 19, 1983, has been revised and is being fielded through December 1986. The manual has a new "how to train" chapter and a glossary. Initial issue is through normal distribution channels.

The Visual Aircraft Recognition TEC lessons were fielded in 1985. If you have an account and have not received your initial issue, contact: Commander, US Army Training Support Center, ATTN: ATIC-ETP-DS (SFC Allen) Fort Eustis, VA 23604-5168 or call AV 927-4861/4862. Whether you call or write, you must furnish your unit identification code.

Ground Observer Aircraft Recognition (GOAR) kits were last revised in 1978. Five hundred and forty sets were produced and fielded with no provisions for replacements. You should use the GOAR Kit slides until replaced with the Aircraft Recognition Training-Visual (ART-V) kits. The GOAR kit or slides are not available for issue.

ART-V is a new slide kit being used at Fort Bliss, Texas. The 35 mm slides are in color with gray aircraft on a blue background. A set features 48 aircraft, each with the same 10 viewing aspects as the GOAR KIT and a 3-view introductory slide. Do not send for these kits. They will be sent automatically to air defense units as the sets are produced. You will be receiving ART-V kits within two to eight months.

The GTA 44-2-10, Aircraft Recognition Playing Cards, were revised in 1985 and are available for issue by TASCs/TASOs worldwide.

The GTA 44-2-5 and 44-2-8 wall posters are presently being revised, but the latest editions are available at TASCs/TASOs.

The ACCP Subcourse No. AD 0574, Edition 4, Visual Aircraft Recognition, is available to personnel enrolled in the ACCP. This subcourse will be revised following the printing of FM 44-30 this year.

Officers' Military Qualification Standards

The Military Qualification Standards (MQS) system has been developed as a professional development tool for officers as a result of a review of education and training for officers.

The MQS system provides a clear picture of the tasks and skills that officers must be able to perform to accomplish the Army mission. Like soldier's manuals for enlisted soldiers, MQS manuals are published as soldier training publications under the management of the Individual Training Evaluation Directorate, U.S. Army Training Support Center, Fort Eustis, Va.

The Army school system, the unit commander and the individual officer share responsibility for developing competent officers. The MQS system is a developmental tool and training guide for junior officers and their commanders as they form a partnership to improve professional development in units.

The system encourages unit commanders to serve as mentors to their junior officers. The MQS manuals identify and standardize military tasks that officers must know how to perform. The tasks addressed by the MQS system are not new. They are the same tasks already identified for either resident (precommissioning, officer basic course or officer advanced course) or nonresident (unit) training. The system

also establishes the educational requirements that officers must meet.

MQS is structured into three levels: MQS I (precommissioning training), MQS II (lieutenant training), and MQS III (captain training). Each level builds upon the former and prepares the officer for increased responsibilities.

Junior officers can expect the following from MQS training:

- ★ Receive standardized training.
- ★ Increase their technical expertise.
- ★ Increase their awareness of what the Army expects of them.
- ★ Enrich their knowledge of the history of the U.S. Army.
- ★ Learn current issues surrounding their branch and the Army in general.
- ★ Gain direction and perspective from the mentor-to-trainee relationship.
- ★ Increase their knowledge concerning professional development.

More information on MQS and specifically on air defense artillery MQS manuals will be provided in coming issues.

Patriot Intercepts Tactical Missiles

A Mach 3-plus Patriot air defense missile intercepted and destroyed a tactical ballistic missile three miles above White Sands Missile Range, N.M., in September during the first test of Patriot's anti-tactical missile capability.

The intercept pitted Patriot against a Lance surface-to-surface missile flying at almost twice the speed of sound. The air defense missile intercepted the Lance at an altitude of approximately 26,000 feet.

Units Must Requisition STP

Units must requisition the newly revised Vulcan System Mechanic and FAAR System Mechanic STP this November in order to receive it in time for the SQT in February.

STP 44-24M14-SM-TC, Vulcan System Mechanic (24M) and FAAR System Mechanic (X7) is scheduled for distribution this November. The next SQT for these MOSs will be based on this revision. The SQT "A-date" of Feb. 1 is unchanged. The 24M and X7 notice will reach the field before the new STP. This may generate questions from soldiers scheduled to take the test.

The revision will present material once found in the soldier's manual in the new STP format. Some tasks will change from one skill level to another based on the results of critical task review board findings, but the technical information will remain virtually the same. Some FAAR tasks pertaining to schedules of maintenance on test equipment and section generators will be added.

New STPs must be requisitioned. They are not automatically distributed. DA Circular 310-85-4, December 1985, has changed requisition procedures for officer and enlisted skills training publications. New publications will be listed in the circular as they are published. Commanders and training managers should ensure their pinpoint requisitions are kept up to date. For more information call Tom Cooper at AV 978-4415 or commercial 915-568-4415.

A Refreshing Attitude

I would like to compliment you on your Spring 1986 issue. In general, the articles were upbeat and positive and addressed some tough real-world problems. It has been my feeling that in the past we, as a branch, have had a tendency to "fiddle" while Rome burned.

I was pleased to see the reference in the "The Branch Lives!" to the pair of articles published in the summer of 1984 [Opinion column: "The Death Of ADA" and "ADA — Branch With A Future"]. It was these two articles, appearing side by side, that convinced me there were two schools of thought in Air Defense Artillery. One was willing to admit that problems existed, while the other whistled in the dark to convince themselves that everything was fine. A refreshing attitude, which pervaded most of the recent issue, is the willingness to identify and solve problems before they become catastrophic.

The only article I found to be in the "we have no problem" category was the short piece by Capt. Eckberg on Stinger field handling trainers (FHTs). To start with, commanders generally know what their responsibilities are, or they don't stay commanders very long. For Capt. Eckberg to glibly remind them that equipment should be handled properly is an insult to every commander's intelligence. The article would have been of much greater use if he had discussed what, if anything, was being done to "ruggedize" the FHTs.

There are obvious distinctions between use and abuse. It has been my experience that most commanders are vehement in their pursuit of abuse because they know the large amount of resources it can remove from their unit. I have always questioned how we can expect our soldiers to train year after year under realistic conditions with equipment that was designed for light use. Plastic parts are fine for one-time or light use, but when used significantly beyond their designed life, such as after a few years of field exercises, they do break.

Unfortunately, that is where the real problems start. Unless things have changed drastically in the last few months, Stinger repair parts are few and prohibitively expensive. If the FHT requires evacuation to support maintenance, you probably won't see it again for months. When faced with the decision of spending more than \$800 for a piece of plastic whose only function is to look like

a cable, it's easy to understand how the FHTs can be victims of unofficially "deferred" maintenance.

On a positive note, I particularly enjoyed Col. Hardy's article about the training developments underway ["New FAAD Mission Training Concept"]. Many of the other branches have been active in procuring and fielding realistic simulators. The benefits of such simulators are twofold: they rapidly increase proficiency, and they are fun to train on, all at absolute minimum operating costs (after initial procurement). To me, that is the combination for training success! My only question of Col. Hardy is: Do we have to wait until 1990?

Christopher L. Shepherd
Capt., AD
USASD, Fort Benjamin Harrison, Ind.

Author Answers

First, as the author of the "positive" of the two articles published in 1984, I really haven't been "whistling in the dark." The message was that, although we have problems, we have the leadership and programs to deal with them. I still believe that. We are not out of the woods, but we have too good a branch not to succeed. There were, and still are, those who don't see the problems. These people are asleep. Now the important question: Must we wait until 1990 for a proper training system? Answer: No. Will it be 1990? Probably. Why? Money.

It has taken two years to formulate new training concepts and to stop going in many different directions. The developmental work is almost finished. The 1/5-scale targets are commercially available, and we are working on the combat tables. The embedded trainers for Chaparral, Vulcan and Stinger have been invented. They need some enhancement but could be fielded in 1 1/2 years to two years if we can clear funding hurdles.

Maj. Gen. Donald R. Infante, chief of Air Defense Artillery, is a great friend of the trainer and is expending personal resources toward making it happen. If anyone can, he can. The Hawk institutional training system (see Page 48) is now funded because he got involved. Now, he is involved in short-range training. Odds are the new trainers won't be fielded until 1990, but I won't bet against the chief making it happen sooner. I can

assure you that I'll keep pushing.

Robert S. Hardy Jr.
Col., AD
Cmdr, 69th ADA Brigade

Col. Hardy was director of the Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, when he wrote this response.

Acht Komma Acht

Mr. Wolf Prow's article, "Steel on Target," *Air Defense Artillery*, Spring 1986, is very interesting and informative. There are several small corrections I would like to make.

The aircraft on Page 32 is a Consolidated Vultee (Convair) B-24 Liberator. The Lancaster has in-line engines and a larger "greenhouse" cockpit area, but otherwise generally resembles the B-24. Also on Page 32, you should really say *Fliegerabwehrkanone*, a single, compound word. On Page 33, "Acht Komma Acht" doesn't, of course, translate to "88." The text is unclear, though you do call it an 8.8 cannon. On page 34, the Soviet plane is the Yakovlev.

I'm sure many of the mistakes are the fault of editors rather than that of the author. My grandfather was a *Hauptmann* in the *Luftwaffe* in charge of a *Flak* battery, and has taught me much of what I know about *Flak*.

Erhard F. Konerding
Documents Librarian
Wesleyan University
Middletown, Conn.

"Acht komma Acht," which evolved into "ack ack," translates to "eight point eight" rather than "eighty eight." Errors detected by Mr. Konerding were the fault of Air Defense Artillery editors, not Mr. Prow.

Do you have a comment about this issue you would like to share with the readers? We encourage letters from everyone. Write to: Editor, Air Defense Artillery magazine, HQ USAADASCH, ATTN: ATSA-DTP-SP, Fort Bliss, TX 79916-7090. Letters should be concise, timely and legible (preferably typed). The staff reserves the right to condense letters as necessary or to refuse publication. Unsigned letters are not acceptable.

A * D * A A S S O C I A T I O N

Spreading the Word

We have a slow but steady flow of applications for Air Defense Artillery Association membership. The word is spreading, but the number of individuals who mail in their applications, instead of mass membership mailings from units, tells us these soldiers are getting the word from sources other than their units. If batteries and battalions work to inform their soldiers and forward the membership requests together, the units will achieve the numbers required for a unit incentive award quicker.

Battalion commanders, please spread the word. A brochure on the ADA Association will be out soon to help you continue the drive.

The ADA Association quarterly newsletter will be out in a few weeks. Look for it. We think all ADA soldiers will find it interesting and informative.

ADA in Blues

The Air Defense Artillery Association awarded an Army dress blue uniform to SSgt. Dennis J. DeLeski, the distinguished graduate of Advanced Non-commissioned Officer Course, Class 4-86. SSgt. DeLeski maintained the highest average in his class. He is a 16R assigned to the 1st Battalion, 59th Air Defense Artillery, the divisional ADA battalion of the 8th Infantry Division.

Order of Saint Barbara

In a recent ceremony held at Fort Bliss, Texas, Maj. John Kelley, Tactics Department, become one of a small company of non-air defenders to receive the Order of Saint Barbara. Maj. Kelley, an Armor officer, was recognized for his outstanding contributions to the branch in teaching combined arms tactics to ADA students. Maj. Kelley's work has been important in helping ADA put its best foot forward in the divisions.

ADA Association Gift Shop

Air defenders now have their own company store — the Air Defense Artillery Association Gift Shop. The store is loaded with specially designed logo items from the cartoon pen of the late Col. Robert Matlick.

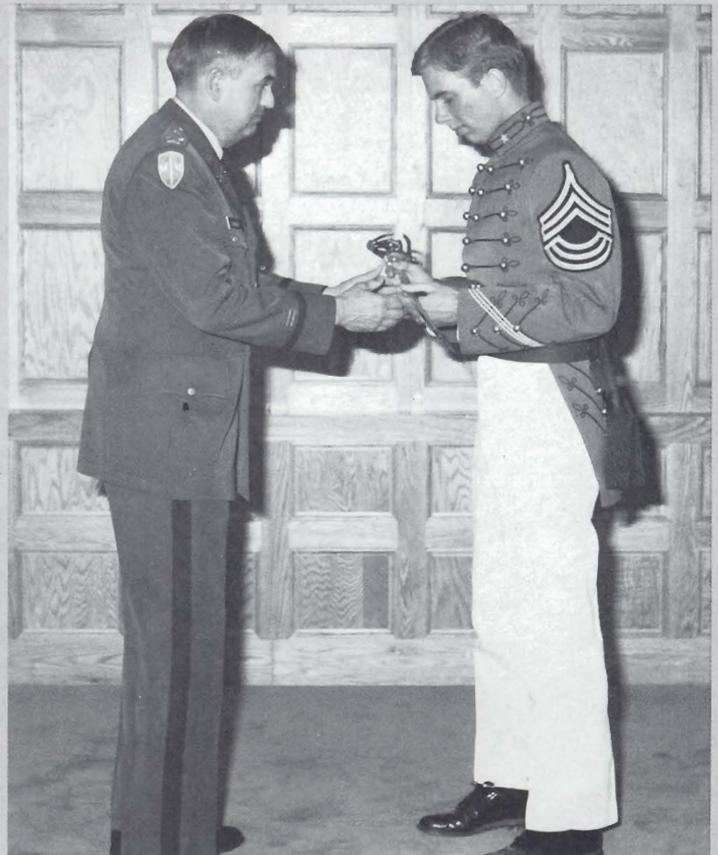
The inventory includes T-shirts, ball caps, bumper stickers, patches, aprons, coffee mugs and belt buckles. Smaller items

are perfect for party favors — spoons, bookmarks, paperweights and letter openers, with the ADA logo, are just a few.

Prestige items include solid walnut boxes, plaques and pen sets topped with stunning brass and red ADA insignias. Pewter beer mugs, playing cards, brass logos, brass door knockers and the popular ADA belt buckle are included in the shop's displays.

Units may have their own unit designation on T-shirts if the order is large enough and advance notice is given. Larger items may be ordered through the shop and sent directly to any address.

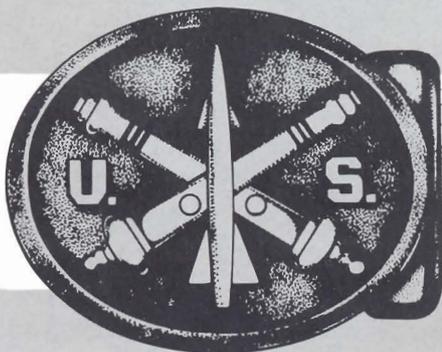
Located in the ADA Museum, Fort Bliss, Texas, the store is open weekdays, 10 a.m. to 4 p.m. For more information, call or write. Call: (915) 568-5412. Write: ADA Gift Shop, Bldg. 5000, Pleasanton Rd., Fort Bliss, Texas, 79916.

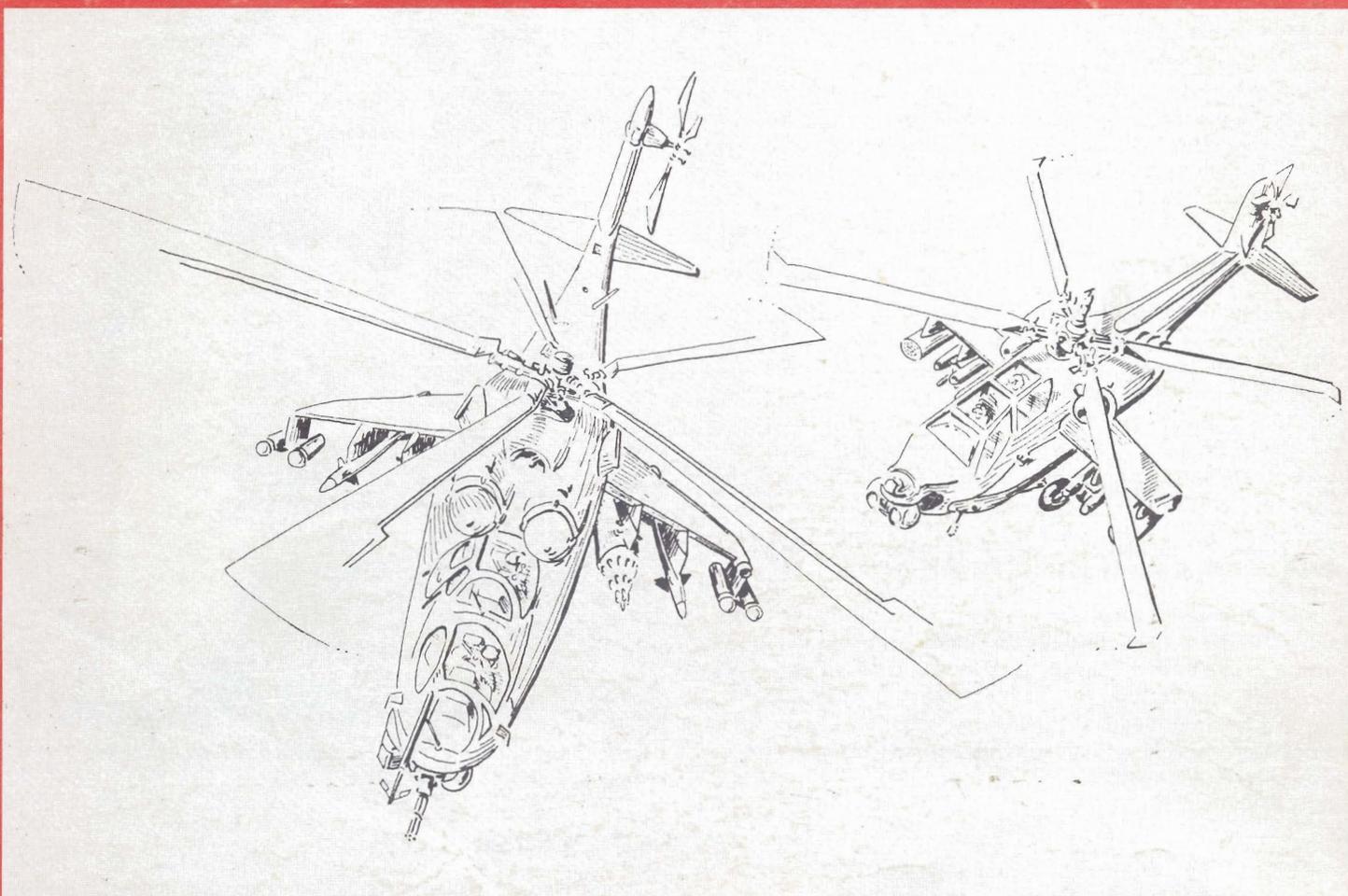


Col. Charles E. Johnson presents the ADA association sabre to U.S. Military Academy Cadet Roger B. Knowles.

Sabre Presented

Cadet Robert B. Knowles is the 1986 recipient of the Air Defense Artillery Association sabre. The sabre is presented to the United States Military Academy graduate who ranks highest among cadets selecting ADA as their branch of service. Cadet Knowles stands twentieth in his class in order of merit, having achieved a cumulative grade point average of 3.88 and has been elected to Phi Beta Kappa. Cadet Knowles will train as a Chaparral/Vulcan platoon leader and will serve in Germany following his attendance at the officer basic course at Fort Bliss, Texas. He hails from Luray, Va.





Coming in the next issue . . .

FAAD's New Ally: Army Aviation Counterair